

## REVISION OF ODONTONEMA (ACANTHACEAE) IN MEXICO

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*Odontonema* Nees comprises about 30 species of shrubs occurring from northern Mexico southward throughout Central America and the West Indies to southeastern Brazil. Several species are commonly cultivated for ornament under glass in temperate regions and out-of-doors in warm regions worldwide. In the only comprehensive treatment of the genus since that of Nees (1847, as *Thyrsacanthus* Nees), an unpublished M. Sci. thesis by Baum (1982a), 26 species were recognized on the basis of morphological characteristics obtained solely from herbarium specimens. Eight of these species were recorded from Mexico.

The history of names applied to this genus, including accounts (sometimes contradictory) of typification of *Odontonema* were provided by Baum (1982a), Baum and Reveal (1980, 1982), and Baum, Reveal, and Nowicke (1983). Lindau (1895) included the genus in subfamily Acanthoideae, tribe Odontonemeae, subtribe Odontoneminae, along with several other American genera, including *Oplonia* Raf. (as *Anthacanthus* Nees) and *Chileranthemum* Oerst. *Odontonema* was distinguished primarily by its lack of axillary spines and its paniculate inflorescences with long and gradually expanded corolla tubes. The morphologically similar genus *Pseuderanthemum* Radlk. was treated by Lindau (1895) in subtribe Pseuderanthemeae. Bremekamp (1965) treated both of these subtribes in subfamily Ruellioideae, tribe Justicieae, subtribe Odontoneminae. Although Bremekamp's (1965) classification was, by his own admission, both tentative and speculative, it has the advantage of uniting in a single taxon the four similar genera treated by Lindau in two subtribes.

Among New World genera of subtribe Odontoneminae, *Odontonema* is most similar to *Chileranthemum*, *Oplonia*, *Pseuderanthemum*, and *Pulcranthus* V. M. Baum, Reveal & Nowicke. All have an androecium of two ditheous stamens and two staminodes, tricolporate (rarely tetracolporate) and hexapseudocolpate (rarely octapseudocolpate) pollen, and a stipitate capsule with an hour-glass shaped head bearing four seeds. Heterostyly has been documented in each of these genera except *Pulcranthus*. A chromosome number of  $n=21$  is also known in *Odontonema*, *Oplonia*, and *Pseuderanthemum* (Daniel & Chuang 1993; Daniel et al. 1990). Chromosome numbers are not known for *Chileranthemum* and *Pulcranthus*. Distinctions among these five genera appear to pertain primarily to differences in form of the corolla, which likely represent adaptations for different floral visitors. Figure 1 illustrates a typical corolla representative of four of these genera. (Corollas of *Oplonia*, which are not shown, are very similar to those of *Chileranthemum*).

Baum (1982a) briefly discussed four major phenetic/phylogenetic groups of species within *Odontonema*. Three of these groups are represented by Mexican species. *Odontonema callistachyum* and its relatives (*O. auriculatum*, *O. cuspidatum*, *O. glaberrimum*, and *O. tubaeforme*) are characterized by their relatively



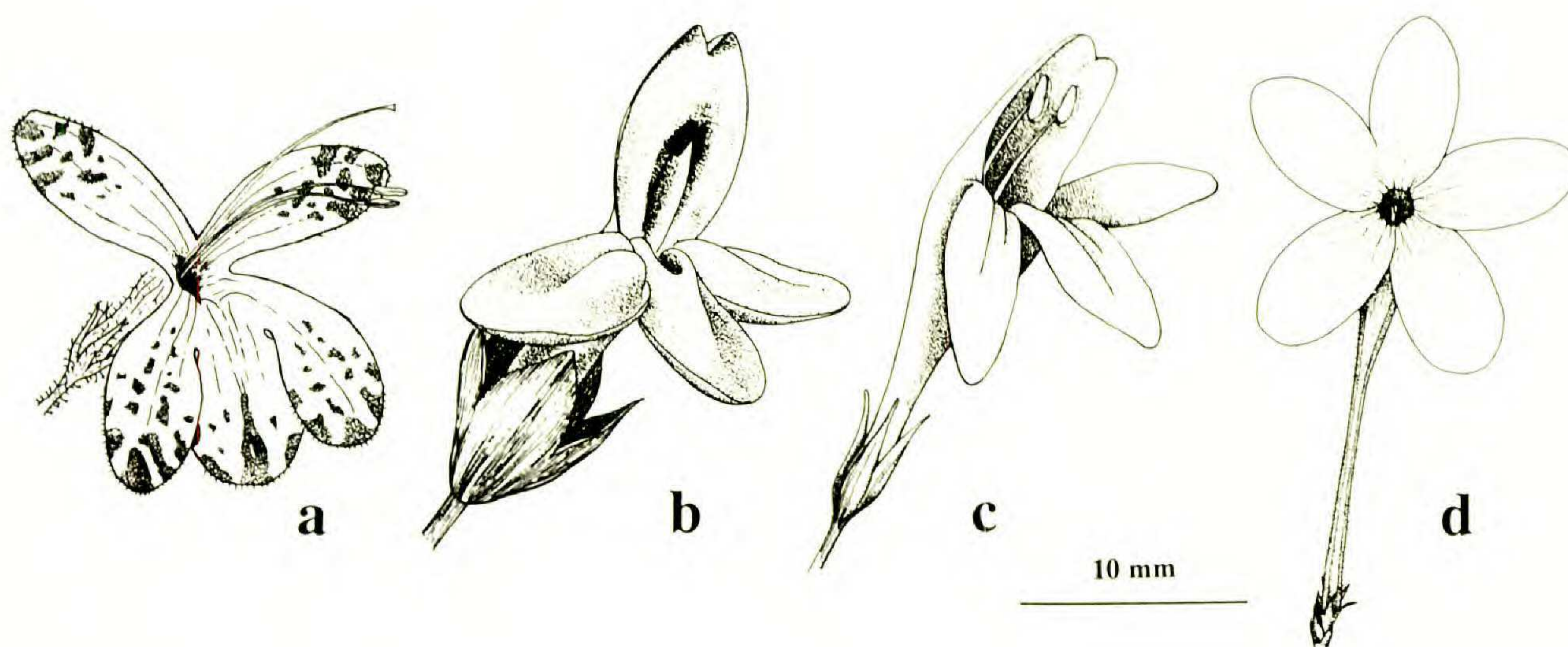


FIG. 1. Corollas typical of four genera of Odontoneminae. a. *Pulchranthus surinamensis* (Bremek.) V.M. Baum, Reveal & Nowicke (redrawn from Baum 1983). b. *Chileranthemum pyramidatum* (Lindau) T. F. Daniel. c. *Odontonema glaberrimum*. d. *Pseuderanthemum verapazense* Donn. Sm. Scale applies to all figures.

large, red to pinkish purple corollas. A group including *O. glabrum* and *O. mertonii* differs primarily by its yellow corollas. *Odontonema albiflorum* was included in a group with white to purple corollas.

Aside from the presence of distyly in all eight species of Mexican *Odontonema*, relatively little is known concerning reproductive biology in this genus. Flowers of Mexican species in the *O. callistachyum* complex all appear to be adapted for pollination by hummingbirds. Corollas are brightly colored, have a well-developed tube with an open throat, lack nectar guides and detectable fragrances, and possess ample quantities of nectar. Styles and Freeman (1993) noted hummingbird visitation to and pollination of "*O. callistachyum*" in Costa Rica. (Because *O. callistachyum* is not known from Costa Rica, their data likely pertain to *O. tubaeforme*.) Plants they studied had a daily secretion of 16  $\mu$ m of sucrose-dominant nectar. Hummingbird visitation to flowers of *Odontonema* in Mexico has been noted on herbarium labels of *O. cuspidatum* (i.e., Wendt *et al.* 2261) and *O. tubaeforme* (i.e., McDade 205). Flowers of other Mexican species differ by their paler (yellow and white) corollas that sometimes possess purplish nectar guides. Additional studies and observations on pollination in *Odontonema* and its relatives are desirable in order to better assess the systematic significance of the differences in floral form.

Pollen of all Mexican species of *Odontonema* was examined with a scanning electron microscope. Grains (Figs. 2, 3) resemble those of related taxa in the Odontoneminae: shape varies from spheric to prolate (sometimes within the same collection); size ranges in length (polar diameter) from 33 to 62  $\mu$ m and in width (equatorial diameter) from 31 to 48  $\mu$ m; the exine comprises a homobrochate reticulum; and, for the most part, there are three primary apertures (colpori) and six subsidiary apertures (pseudocolpi). Also, as in some other Odontoneminae, the pseudocolpi of adjacent apertures sometimes fuse toward the poles, resulting in pseudocolpal ellipses in the mesocolpia. Only *O. cuspidatum* (Fig. 2c, d), which has four colpori and eight pseudocolpi, differs from this common pattern. In her survey of pollen in 20 species of *Odontonema*, Baum (1982a) also noted the exceptional grains of *O. cuspidatum*.

The following revision is based on study of herbarium specimens, scanning electron microscopic examination of pollen, and field observations. It differs from



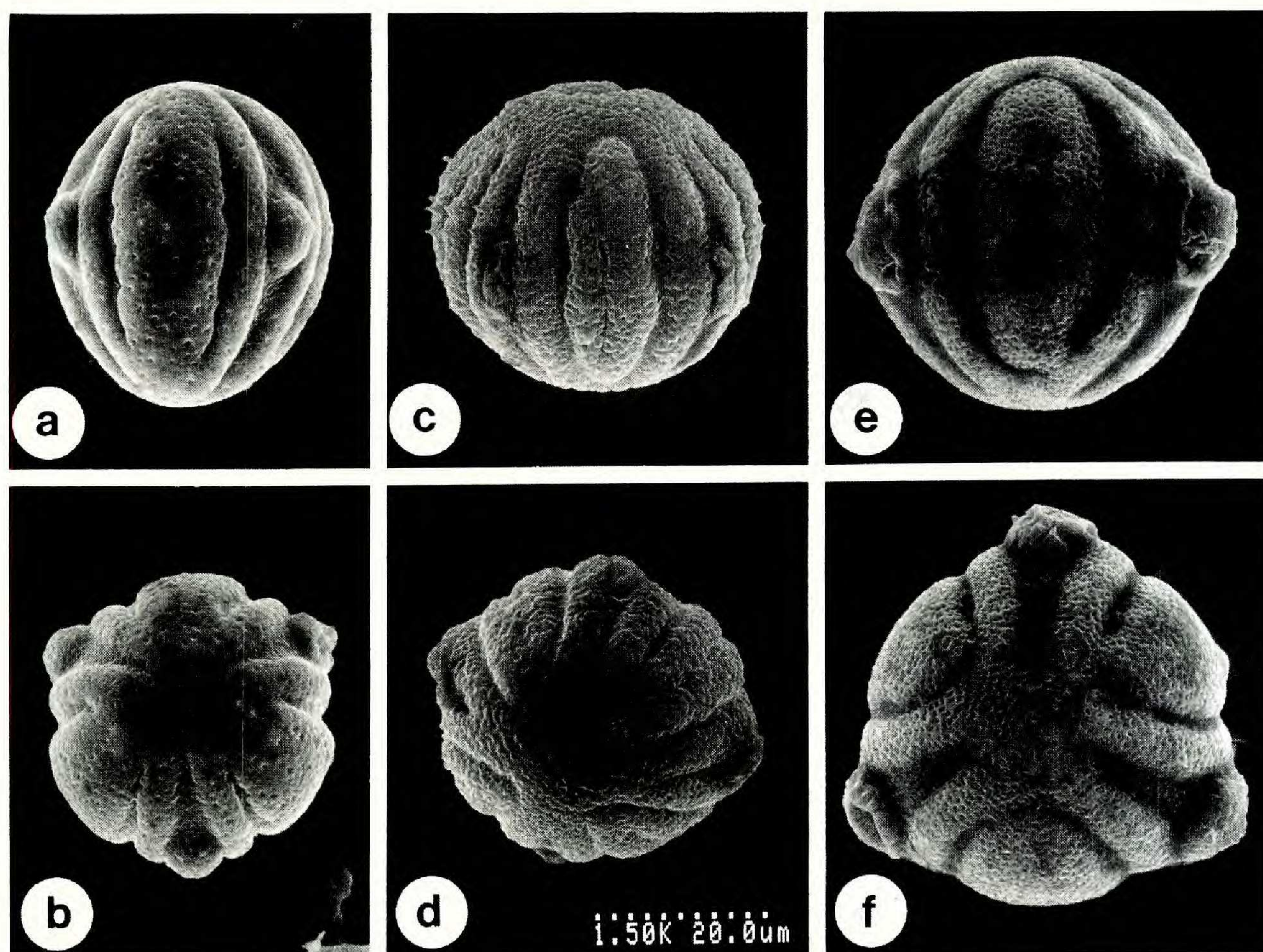


FIG. 2. Pollen of three species of *Odontonema*. a, b, *O. albiflorum* (Téllez & Villaseñor 6634): a, intercolpal view; b, polar view. c, d, *O. cuspidatum* (Breedlove & McClintock 23784): c, intercolpal view; d, polar view. e, f, *O. mortonii* (Alexander 444): e, intercolpal view; f, polar view. Scale applies to all figures.

that of Baum (1982a) by recognizing *O. auriculatum*, treating *O. amicorum* as a synonym of *O. tubaeforme*, treating *O. breedlovei* as a synonym of *O. callistachyum*, adding and realigning several synonyms, and utilizing different suites of characters for distinguishing species. Future studies will need to address the questionable generic distinctions among *Odontonema* and its close relatives noted above.

### TAXONOMY

**Odontonema** Nees, *Linnaea* 16: 300. 1842, nom. cons. *Thyrsacanthus* Nees in Mart., *Fl. bras.* 9: 97. 1847, nom. superfl.—TYPE: Garden specimen without date or collector (GZU), type cons.

*Diateinacanthus* Lindau, *Bull. Herb. Boissier*, ser. 2, 5: 369. 1905.—TYPE: *Diateinacanthus hondurensis* Lindau [= *Odontonema hondurense* (Lindau) D. N. Gibson].

Erect, caulescent, perennial herbs or shrubs (rarely, and probably erroneously, reported as lianas) with cystoliths. Leaves opposite, sessile to petiolate, margin entire to crenate. Inflorescence of contracted or expanded dichasia in axils of bracts, collectively forming a loose to dense, sometimes basally branched, usually terminal spike (i.e., dichasia and flowers sessile), raceme (i.e., dichasia sessile and flowers pedicellate), or thyrs (i.e., dichasia pedunculate); dichasia alternate to opposite to whorled at inflorescence nodes, 1-many-flowered (i.e., 18 or more



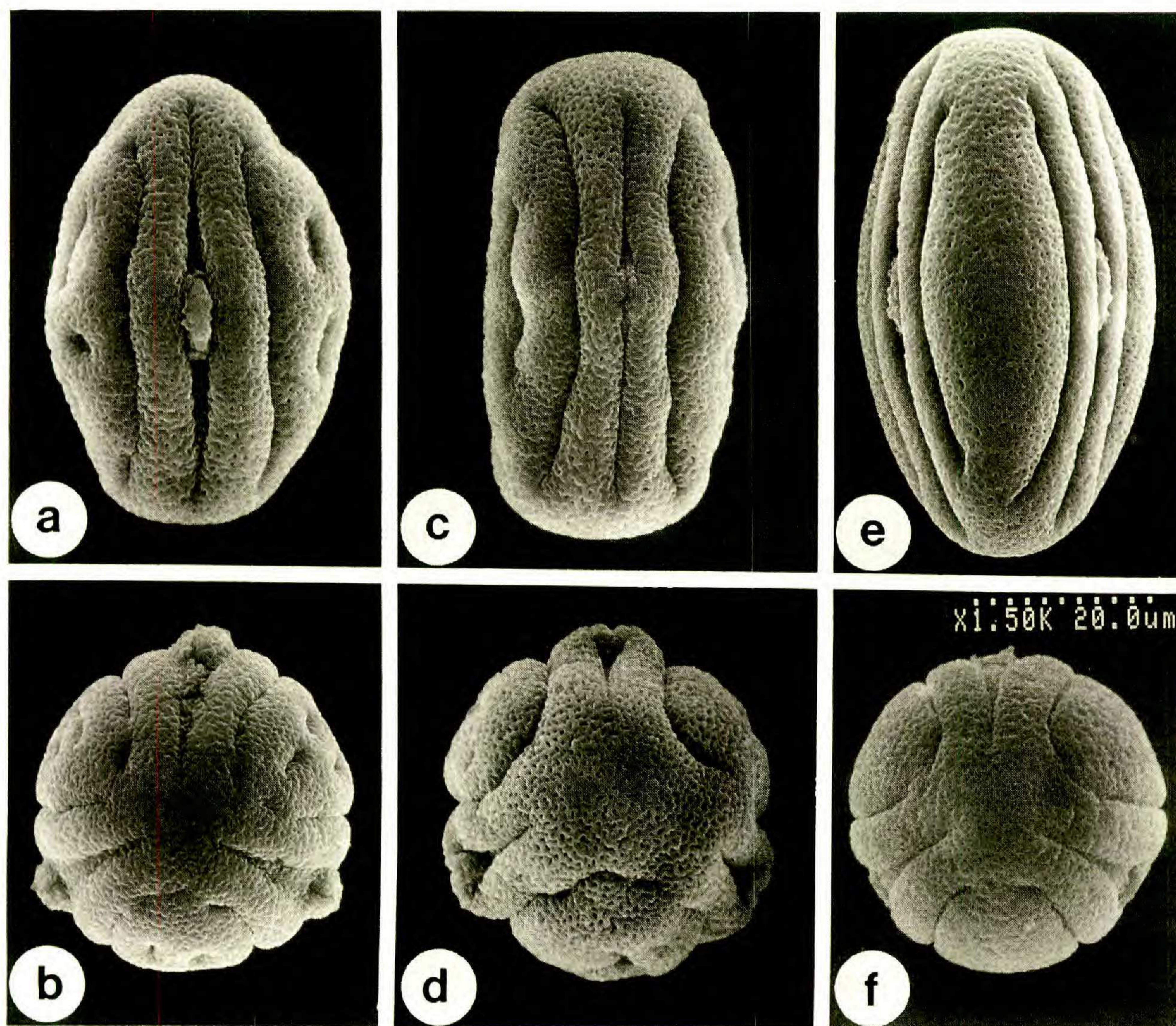


FIG. 3. Pollen of three species of *Odontonema*. a, b, *O. callistachyum* (Daniel & Bartholomew 5014): a, colpal view; b, polar view. c, d, *O. glabrum* (Breedlove & Bourell 67391): c, colpal view; d, polar view. e, f, *O. tubaeforme*: e, intercolpal view (Daniel & Bartholomew 4991); f, polar view (Hoover 137). Scale applies to all figures.

flowers), sessile or pedunculate. Flowers heterostylous, usually pedicellate, subtended by 2 bracteoles. Calyx deeply 5-lobed, lobes equal. Corolla white, yellow, purple, pink, or red, externally glabrous or pubescent, internal surface of limb covered with sessile to subsessile glands (in ours), tube usually expanded distally into a prominent throat, limb subactinomorphic to bilabiate, upper lip bilobed, lower lip trilobed. Androecium of 2 stamens and 2 staminodes, stamens inserted at base of corolla throat, thrum stamens exserted, pin stamens usually included in throat, anthers ditheous, thecae equal in length, parallel, equally inserted; pollen prolate to spheric, 3- or 4-colporate, each colpus flanked on each side by a pseudocolpus. Thrum style included in corolla tube, pin style exserted from mouth of corolla; stigma  $\pm$  funnelform (i.e., lobes indistinct) or bilobed, lobes equal or unequal in length. Capsule stipitate, stipe slightly shorter than or nearly equaling head in length, head obovoid to subellipsoid (often with a medial constriction). Seeds 4 per capsule, borne on hooklike retinacula, lenticular, lacking trichomes. Base chromosome number:  $x = 21$ .

A genus of 29 species restricted to the New World tropics and subtropics with eight species in Mexico (Baum 1982a, 1982b; Daniel 1986; Wasshausen 1992). Both *O. hondurensis* (Lindau) D. N. Gibson (Belize, Guatemala, Honduras) and



*O. steyermarkii* Leonard (Guatemala) might be expected to occur in Mexico (e.g., Chiapas) but have not been collected there. The former differs from known Mexican species by its yellow flowers in branching panicles; the latter differs by its nearly glabrous inflorescence with salmon-pink flowers in pedunculate dichasia.

#### KEY TO THE MEXICAN SPECIES OF ODONTONEMA

1. Corolla red or pinkish purple.
  2. Corolla pinkish purple; rachis densely and evenly pubescent. *O. callistachyum.*
  2. Corolla red; rachis glabrous or sparsely pubescent, the trichomes sometimes concentrated in 2 or more lines.
    3. Leaves sessile, auriculate at nodes. *O. auriculatum.*
    3. Leaves subsessile to petiolate, not auriculate.
      4. At least some, usually most, dichasia whorled at inflorescence nodes; rachis pubescent with flexuose to retrorse to appressed trichomes 0.2–1 mm long, trichomes usually concentrated in 2 or more lines; corolla throat 9–13 mm long. *O. tubaeforme.*
      4. Dichasia opposite at inflorescence nodes; rachis glabrous or evenly pubescent with erect to flexuose to antrorse trichomes 0.05–0.5 mm long; corolla throat 3–10 mm long.
        5. Dichasia sessile (rarely subsessile with peduncles to 1 mm long); upper lip of corolla 6–13 mm long; lower lip of corolla 6.5–14 mm long; pollen 3-colporate. *O. glaberrimum.*
        5. Dichasia subsessile to pedunculate (at least some, usually most, dichasia clearly pedunculate in each inflorescence, the peduncles up to 25 mm long); upper lip of corolla 2–5 mm long; lower lip of corolla 2.5–6 mm long; pollen 4-colporate. *O. cuspidatum.*
1. Corolla entirely yellow or pale blue to white with purplish markings on lower lip.
  6. Young stems evenly puberulent with retrorse (to flexuose) eglandular trichomes; rachis, abaxial surface of bracts, and style pubescent; corolla pale blue to white with purplish markings on lower lip, 10–17 mm long; dichasia mostly whorled (opposite proximally) at inflorescence nodes; thecae 1.5–1.9 mm long. *O. albiflorum.*
  6. Young stems glabrous (or rarely in *O. mortonii* some internodes sparsely bifariously pubescent with antrorse eglandular trichomes); rachis, abaxial surface of bracts, and style glabrous; corolla yellow, lacking markings on lower lip, 22–32 mm long; dichasia opposite; thecae 2.3–3.1 mm long.
    7. Inflorescence of  $\pm$  contracted dichasiate racemes (or panicle of racemes); dichasia sessile (or subsessile, i.e., borne on peduncles to 0.5 mm long); thecae 2.3–2.5 mm long; Oaxaca. *O. mortonii.*
    7. Inflorescence of expanded and open thyrses; dichasia pedunculate, peduncles (1.5–) 4–34 mm long; thecae 2.6–3.1 mm long; Chiapas and Guatemala. *O. glabrum.*

***Odontonema albiflorum*** Leonard, Publ. Carnegie Inst. Wash. 461: 219. 1936.—  
 TYPE: GUATEMALA. Alta Verapaz: Cubilquitz, 350 m, Feb 1901, *von Tuerckheim* 7937 (holotype: US!; isotype: US!).

Shrub to 1 m tall, young stems subquadrate to quadrate-sulcate, evenly puberulent with retrorse (to flexuose) eglandular trichomes 0.05–0.2 mm long. Leaves petiolate, petioles to 13 mm long, blades ovate-elliptic to obovate-elliptic, 160–415 mm long, 58–135 mm wide, 2.1–3.6 times longer than wide, acuminate to falcate at apex, attenuate at base and often somewhat auriculate at apex of petiole, surfaces puberulent with mostly straight (to antrorse) eglandular trichomes less than 0.05–0.1 (–0.2) mm long, trichomes usually restricted to midvein or major veins. Inflorescence of dense, terminal (and sometimes axillary), pedunculate, unbranched (rarely branched at base) dichasiate spikes or racemes to 150 mm long, 5–16 mm in diameter near midspike, rachis puberulent with erect to antrorse to antrorsely



appressed eglandular trichomes 0.05–0.5 mm long; dichasia mostly whorled (opposite proximally) at nodes, 3- or more-flowered, sessile. Bracts often subfoliose (e.g., ovate-lanceolate) proximally, soon becoming subulate, bracts near middle of inflorescence subulate, 2.5–3.8 mm long, 0.8–1 mm wide, abaxial surface pubescent like rachis. Bracteoles and secondary bracteoles triangular to triangular-subulate, 1.5–3 mm long, 0.7–1 mm wide, abaxial surface pubescent like bracts. Flowers sessile or pedicellate, pedicels 1.5–5 mm long, nearly glabrous or sparsely puberulent. Calyx 2–3 (–5) mm long, tube 0.3–0.8 mm long, lobes subulate, 1.5–2.3 (–4) mm long, 0.5–0.8 mm wide, abaxially glabrous or nearly so. Corolla pale blue to white with purplish markings on lower lip, 10–17 mm long, externally glabrous (although margins of lobes ciliolate), tube 7–10 mm long, distally barely expanded into a throat, throat 2.5–4 mm long, 1.5–2 mm in diameter (measured flat) near midpoint, upper lip 5.3–7 mm long, lobes elliptic, 2–4.5 mm long, 1.3–1.9 mm wide, lower lip 5.5–7 mm long, lobes linear-elliptic, 4–5.5 mm long, 2–2.5 mm wide. Thrum stamens 7–9.5 mm long, pin stamens 2.5 mm long, thecae 1.5–1.9 mm long; pollen 3-colporate; staminodes 0.6–1.5 mm long. Thrum style 4–5 mm long, pin style 9–12 mm long, the style proximally (or  $\pm$  throughout) pubescent with eglandular trichomes; stigma 0.2 mm long, lobes indistinct. Capsule 18–25 mm long, glabrous, stipe 9–13 mm long, head 9–12 mm long. Seeds 3.5–4 mm long, 2.5–3 mm wide, surface rugose to tuberculate; outline of seed shape unknown. Chromosome number unknown.

Phenology. Flowering: November–May; fruiting: January–May.

Distribution. Mexico (Chiapas; Fig. 4), Belize, Guatemala, and Honduras; in lowland rain forests; 100–520 m (up to 1600 m in neighboring Guatemala).

ADDITIONAL SPECIMENS EXAMINED. **Mexico.** CHIAPAS: Mpio. Ocosingo, near ruins of Bonampak at junction of rd from Lacanjá to Echeverría and rd from Chancalá, *Breedlove & Almeda* 57975 (CAS); Mpio. Ocosingo, 25 km WSW of Frontera Echeverría and 10 km N of Bonampak, *Davidse et al.* 20526 (BM, MEXU); 37 km NW of Bonampak, 6 km NNW of Nuevo Guerrero, *Davidse et al.* 20537 (BM, MEXU); Mpio. Ocosingo, 2 km W de Crucero Corozal, camino Palenque–Boca Lacantum, *Martínez S.* 10129 (MEXU), 10186 (CAS); Mpio. Ocosingo, en campamento COFOLASA, 24 km SE de Crucero Corozal, *Martínez S.* 11174 (MEXU); Mpio. Ocosingo, Crucero Corozal, camino Palenque–Boca Lacantum, *Martínez S.* 11508 (MEXU), 12081 (MEXU); Mpio. Ocosingo, 15 km NW de Boca Lacantum camino a Palenque, *Martínez S.* 11867 (CAS, MEXU); Mpio. Ocosingo, 2 km SE de Nvo. Guerrero, camino Palenque–Boca Lacantum, *Martínez S.* 14674 (MEXU); Mpio. Ocosingo, 2 km SE de Nvo. Guerrero, camino Palenque–Boca Lacantum, *Martínez S.* 16954 (CAS, MEXU); Mpio. Ocosingo, en Crucero Corozal sobre el camino Palenque–Boca Lacantum, *Martínez S.* 17760 (CAS, F); Mpio. Ocosingo, Nvo. Guerrero, camino Palenque–Boca Lacantum, *Martínez S.* 18105 (MEXU); Mpio. Ocosingo, Río Lacanjá, 3 km S del Centro Arqueológico Bonampak, *Meave et al.* B-187 (ENCB, MEXU); near junction of Río Perla and Río Jataté at San Quintín and near Laguna Miramar, *Sohns* 1703 (DS, MICH, UC, US); 36–38 km E of Tziscão o 7–9 km E de Amparo Agua Tinta, sobre el camino de Montebello a Bonampak, *Téllez & Villaseñor* 6634 (CAS, ENCB, MEXU).

***Odontonema auriculatum*** (Rose) T. F. Daniel, Southw. Naturalist 31: 174. 1986. *Jacobinia auriculata* Rose, Contr. U.S. Natl. Herb. 1: 349. 1895.—TYPE: MEXICO. Colima: without locality, 27–28 Feb 1891, *Palmer* 1323 (holotype: US!; isotypes: GH! K! US!).

Shrub (sometimes leaning) to 2 m tall, young stems quadrate, glabrous. Leaves sessile, blades ovate-elliptic to elliptic to subspatulate, 30–216 mm long, 7–87 mm wide, 2.3–4.7 times longer than wide, acuminate to falcate at apex, attenuate or narrowed proximally into a winglike flange, auriculate at node, surfaces glabrous or somewhat scurfy (rarely sparsely pubescent along midrib on abaxial surface). Inflorescence of loose to dense, terminal, pedunculate, basally branched (if at all)



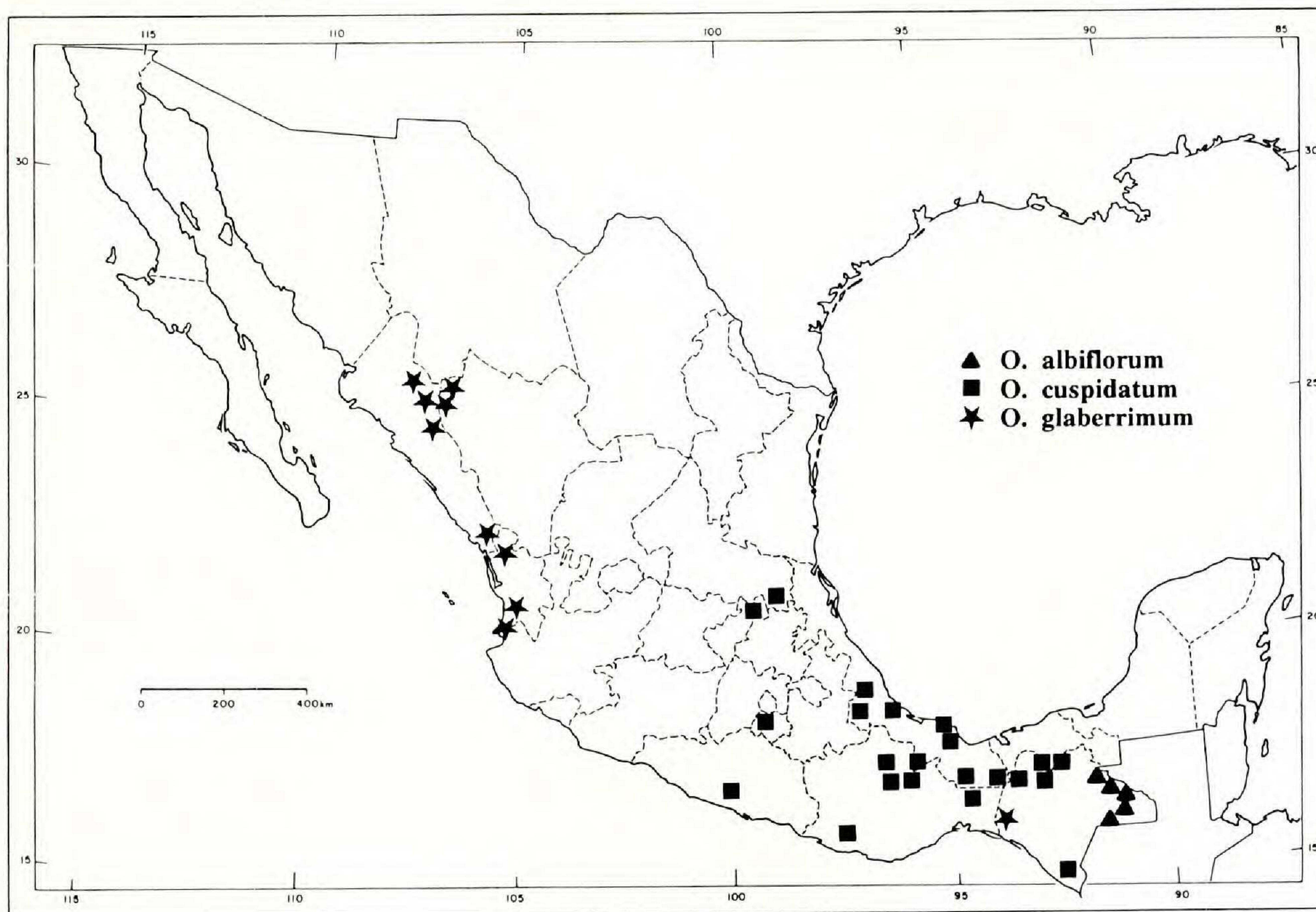


FIG. 4. Distribution in Mexico of *Odontonema albiflorum*, *O. cuspidatum*, and *O. glaberrimum*.

dichasiate thyrses (or with some dichasia occasionally sessile) to 150 mm long, 15–37 mm in diameter near midpoint of fertile portion, rachis glabrous to very sparsely pubescent with inconspicuous eglandular trichomes to 0.05 mm long; dichasia opposite at nodes, usually 3- or more-flowered, (sessile to) pedunculate, peduncles 1–4 mm long, glabrous. Bracts triangular to lance-subulate to subulate, those near middle of inflorescence 1.5–4 mm long, 0.5–1.3 mm wide, abaxial surface glabrous, margin ciliate. Bracteoles and secondary bracteoles triangular to subulate, 1–2 mm long, 0.5–1 mm wide, abaxial surface glabrous. Flowers pedicellate, pedicels 4–10 mm long, glabrous. Calyx 2–5 mm long, tube 0.3–0.8 mm long, lobes triangular-subulate to lance-subulate to subulate, 1.4–4 mm long, 0.5–0.8 mm wide, abaxially glabrous. Corolla red, (20–) 25–30 mm long, externally glabrous, tube 13–20 mm long, gradually to  $\pm$  abruptly expanded distally into a distinct throat, 4.5–7 mm long, 3–5 mm wide, upper lip (6–) 9–12 mm long, lobes rounded, 1–2.5 mm long, 1–2 mm wide, lower lip (6–) 9–13 mm long, lobes elliptic, (6–) 8.5–11.5 mm long, 2.5–4 mm wide. Thrum stamens 13–15 mm long, pin stamens 6 mm long, thecae 2.2–2.8 mm long; pollen 3-colporate; staminodes 0.5 mm long. Thrum style 10–10.5 mm long, pin style 21 mm long, sparsely pubescent  $\pm$  throughout; stigma bilobed, lobes equal, 0.1–0.2 mm long. Capsule 18–25 mm long, glabrous, stipe 7–12 mm long, head 10.5–13 mm long. Seeds subcordate in outline, 4–6 mm long, 3.5–4.3 mm wide, surface smooth. Chromosome number unknown.

Phenology. Flowering: January–May; fruiting: February–May.

Distribution. Western and southern Mexico (Colima, Guerrero, Michoacán, Nayarit, Oaxaca; Fig. 5); in tropical deciduous forests and tropical subdeciduous forest; 60–230 m.

ADDITIONAL SPECIMENS EXAMINED. **Mexico.** COLIMA: Armeria, *Palmer 1286* (NY, in part).—GUERRERO: between Petatlán and Camalotito, 6.9–7.9 mi SW of Camalotito, *Daniel & Bartholomew 4913* (CAS, DUKE, K, MICH); Escuela Agropecuaria, carr. Zihuatanejo–Ixta, *Germán et al. 230*





FIG. 5. Distribution of *Odontonema auriculatum*, and of *O. tubaeforme* in Mexico.

(MEXU); Atoyac, *Hinton et al.* 11215 (K, MICH, RSA, UC, US).—MICHOACÁN: Chacalapa, *Hinton et al.* 13770 (US); Aquila, *Hinton et al.* 15812 (K, MICH, RSA, UC, US).—NAYARIT: Mpio. Compostela, 4 km NE de Valle de Bandera, 20°50'N, 105°12'W, *Flores F. & Ruenes* 2042 (MEXU, MICH); 3.5 km E de Jumatán, camino a la carr. Tepic–Mazatlán, *Téllez* 10260 (MEXU); Mpio. Compostela, El Ahuacate Mocho, 7 km NE de Valle de Banderas, 20°50'N, 105°14'W, *Tenorio L. et al.* 15565 (MEXU, MICH).—OAXACA: Pinotepa, *Galeotti* 510K (W).

***Odontonema callistachyum*** (Schltdl. & Cham.) Kuntze, Revis. gen. pl. 2: 494. 1891. *Justicia callistachya* Schltdl. & Cham., Linnaea 6: 370. 1831. *Thyrsacanthus callistachyus* (Schltdl. & Cham.) Nees in A. DC., Prodr. 11: 326. 1847.—TYPE: MEXICO. Veracruz: Misantlae, 1828, *Schiede s.n.* (holotype: B, destroyed; probable isotype: W!).

*Thyrsacanthus callistachyus* var. *amplus* Nees in A. DC., Prodr. 11: 326. 1847.—TYPE: MEXICO. Veracruz: Cordillera, 3000 ft, Dec 1840, *Galeotti* 926 (lectotype, here designated: K ex hb. Hook.!; isoelectotypes: BR, G, P! W!).

*Thyrsacanthus lilacinus* Lindl., J. Hort. Soc. London 6: 159. 1851.—TYPE: plants cultivated under “*Justicia lilacina*” in Garden of the Horticultural Society of London from an unknown source (presumed to be tropical America) fide Lindley and Paxton in Paxt. fl. gard. 2: 77. 1851 (holotype: CGE, photo US!).

*Thyrsacanthus geminatus* Donn. Sm., Bot. Gaz. (Crawfordsville) 13: 75. 1888. *Odontonema geminatum* (Donn. Sm.) S. F. Blake, Contr. Gray Herb. 52: 104. 1917.—TYPE: GUATEMALA. Alta Verapaz: Pansamalá, 3800 ft, Oct 1885, *von Tuerckheim* 740 (holotype: US!; isotypes: F! G, GH! K! M, NY, P! US!). Although Donnell Smith also noted another date in the prologue (i.e., May 1887), the holotype and all isotypes examined bear the earlier date.



*Odontonema breedlovei* V. M. Baum, Brittonia 34: 427. 1982.—TYPE: MEXICO. Chiapas: Mpio. Ocosingo, along streams near Lacanjá, 2 Apr 1973, *Breedlove* 34473 (holotype: DS!).

Perennial herb or shrub to 3.5 (–5) m tall, young stems quadrate to quadrate-sulcate, glabrate or sparsely pubescent with flexuose to antrorsely appressed eglandular trichomes 0.2–0.7 mm long, trichomes evenly disposed or concentrated in 2 lines, the stems sometimes also covered with sessile glands less than 0.1 mm in diameter. Leaves petiolate, petioles to 27 mm long, blades ovate to ovate-elliptic to elliptic to obovate-elliptic, 63–300 mm long, 21–163 mm wide, 1.8–4 times longer than wide, acuminate to falcate at apex, acute to attenuate at base, surfaces pubescent with cauline-type trichomes, mostly along midvein, or glabrate. Inflorescence of loose to dense, terminal, pedunculate, often basally branched dichasiate racemes (rarely thyrses) to 600 mm long, 20–220 mm in diameter (including branches) near midpoint of fertile portion, rachis evenly and densely pubescent with antrorse to antrorsely appressed eglandular trichomes 0.2–0.6 mm long; dichasia opposite (rarely whorled) at nodes, 3–18- or more-flowered, sessile (rarely borne on peduncles to 2 mm long), sometimes 2 dichasia present per bract. Bracts lanceolate to subulate to triangular, those near middle of inflorescence 2–8.5 (–13) mm long, 1–3 mm wide, abaxial surface pubescent like rachis. Bracteoles and secondary bracteoles lanceolate to subulate to triangular, 1–6 (–8) mm long, 0.5–2 mm wide, abaxial surface pubescent like bracts. Flowers pedicellate, pedicels often with a purplish cast, 2–12 (–18) mm long, pubescent like rachis. Calyx often with a purplish cast, 2.5–6.5 mm long, tube 0.5–1.2 mm long, lobes subulate, 2–5.7 mm long, 0.3–1 mm wide, abaxially pubescent like rachis or sparsely pubescent with antrorse eglandular trichomes 0.1–0.2 mm long or nearly glabrous. Corolla pinkish purple, (12–) 17–30 mm long, externally glabrous (although margins of lobes ciliolate), tube 6.5–19 mm long, expanded distally into a distinct throat, throat (4.5–) 5–10 mm long, (2.5–) 3–4.5 mm in diameter (measured flat) near midpoint, upper lip (3–) 4.5–11 mm long, lobes rounded to subacute, 1.5–3.5 mm long, 1–3.3 mm wide, lower lip (3–) 4–12.5 mm long, lobes linear to elliptic, (3–) 4–12 mm long, (1.5–) 2.5–4.5 mm wide. Thrum stamens 8–13 mm long, pin stamens 4–6 mm long, thecae 1.5–2.5 mm long; pollen 3-colporate; staminodes 0.6–4 mm long. Thrum style 5–13 mm long, pin style (11–) 13–21 mm long, the style pubescent throughout with eglandular trichomes; stigma 0.2–0.4 mm long, funnelform or equally bilobed. Capsule (10.5–) 15–23 mm long, glabrous, stipe (4–) 6–11 mm long, head (6.5–) 8.5–13 mm long. Seeds subcordate in outline, 3–5 mm long, 2.6–3.3 mm wide, surface rugose (not tuberculate). Chromosome number unknown.

Phenology. Flowering: October–July; fruiting: October–May.

Distribution. Mexico (Chiapas, Guerrero, Hidalgo, Jalisco, Michoacán, Oaxaca, Puebla, Querétaro, San Luis Potosí, Tabasco, Veracruz; Fig. 6), Belize, and Guatemala; in lowland rain forests, montane rain forests, tropical deciduous forests, tropical subdeciduous forests, evergreen seasonal forests, mesophytic montane forests, mixed oak woodlands, and pine-oak forests; 40–2000 m; plants are often cultivated in many parts of Mexico; it is not certain that all of the specimens cited below are from wild plants.

Local names. “Canutillo” (*Williams* 8610); “Cruz nichim” (Tzeltal, *Brett* 795).

Uses. Crushed leaves are used as a plaster for swelling (*Brett* 795).

Unfortunately, the holotype of *O. callistachyum* was destroyed at B. A specimen at W has a label that indicates, “in sylvis Misanthiae” and “Mart. G.” Added



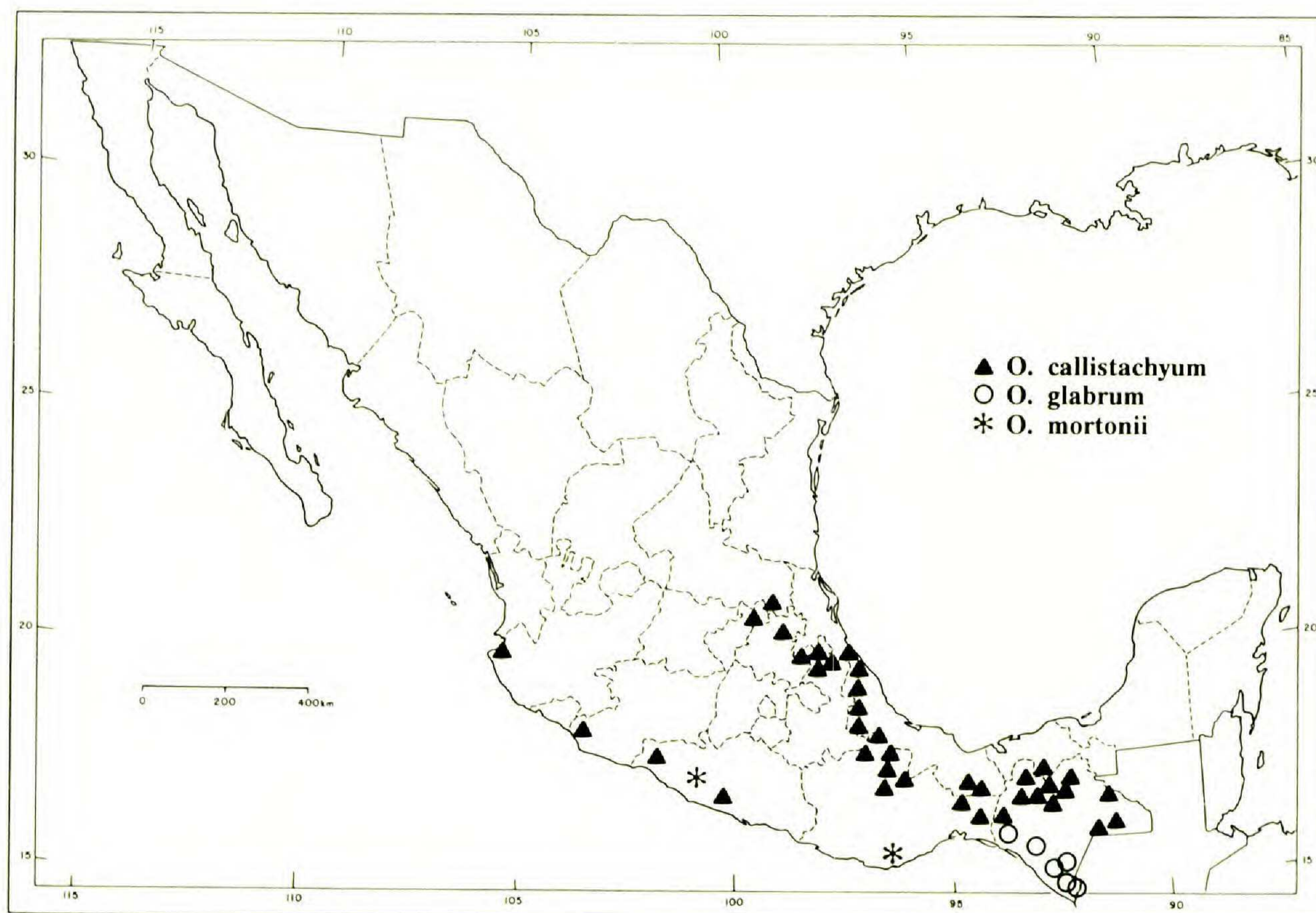


FIG. 6. Distribution of *Odontonema callistachyum* (Mexico only), *O. glabrum* (Mexico only), and *O. mortonii*.

to this information in different inks are "1830/l.B." and "12 Schiede et Deppe." This specimen likely is an isotype.

*Galeotti* 926 at K is here chosen as the lectotype of *Thyrsacanthus callistachyus* var. *amplus*. In the protologue Nees also cited, "Claussen! n. 277 et 407 in h. Hooker." In Hooker's herbarium at K there are Jürgensen (not Claussen) specimens 877 (the initial numeral looks very much like a "2") and 407. *Thyrsacanthus lilacinus* is placed in synonymy here, as was done by Leonard (1936). Baum (1982a) did not treat this name. The coloration and form of the corolla as well as the "downy" rachis (fide Paxton reference noted above) readily place this species in *O. callistachyum*. A photograph of the type also looks like *O. callistachyum*.

*Justicia corymbulosa* Bertol., which was included in the synonymy of *O. callistachyum* by Gibson (1974), is discussed below under excluded names.

Baum's (1982a) revision differs significantly from that of Gibson (1974) for the Flora of Guatemala in its treatment of *O. callistachyum* and related species. Gibson included *O. cuspidatum*, *O. steyermarkii*, and *O. tubaeforme* within a variable and widely distributed *O. callistachyum*. She noted that plants in this complex had been separated into various species based on pubescence of the rachis, corolla color, and/or the number of flowers in a dichasium. She did not judge these differences to provide dependable criteria upon which to distinguish species. Although Baum did not specifically address Gibson's treatment, she utilized these characters prominently in recognizing species, including both *O. cuspidatum* and *O. tubaeforme*. Figure 7 shows some of the distinguishing characteristics among *O. callistachyum* and its three closest relatives in Mexico. *Odontonema steyermarkii* is known only from Guatemala and differs from *O. callistachyum* by its glabrous or nearly glabrous rachis, pedunculate dichasia, and salmon-pink corollas.



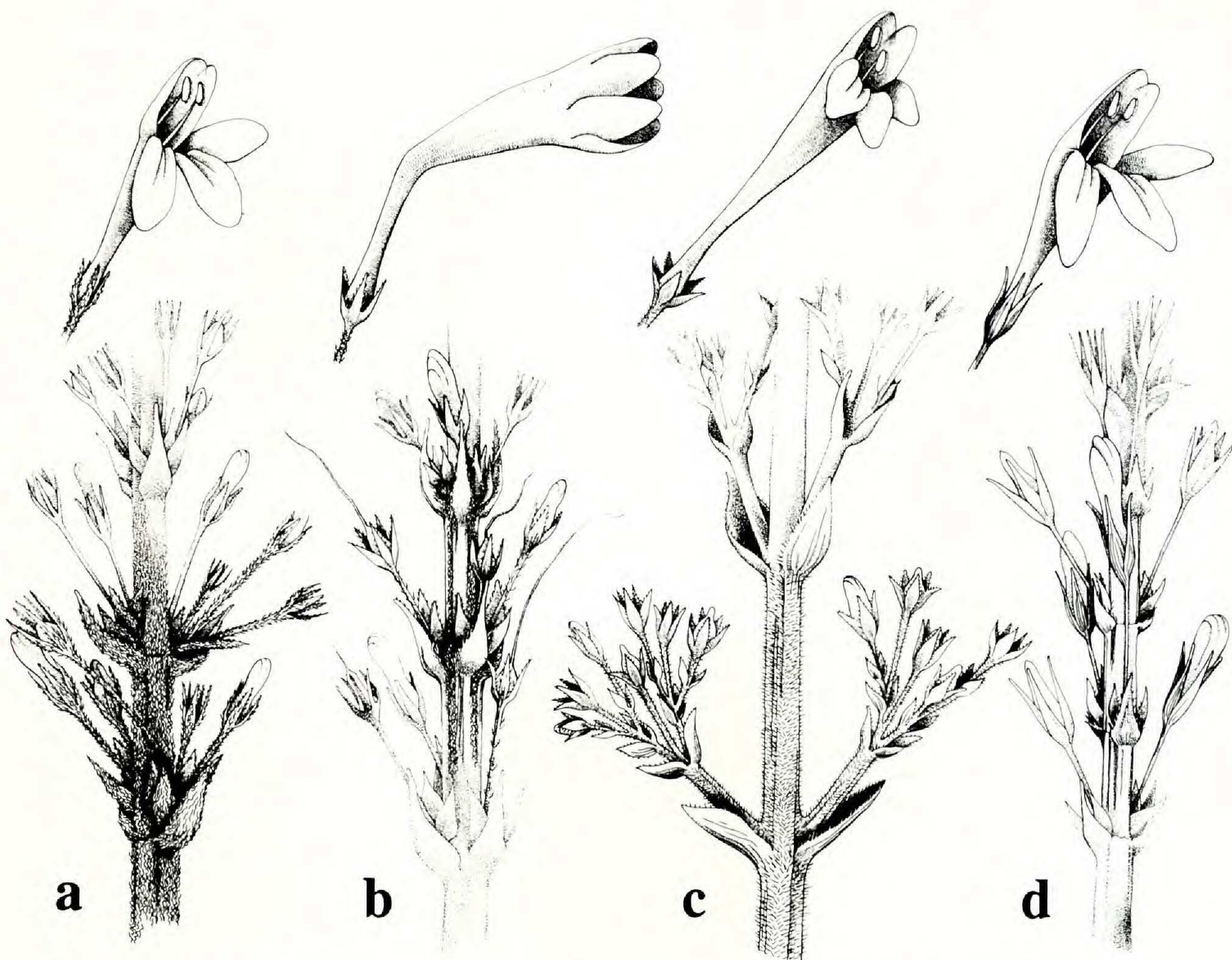


FIG. 7. Comparison among inflorescences and flowers of four species of *Odontonema*. a. *O. callistachyum*, inflorescence (Breedlove & Keller 49594), flower (Breedlove & Almeda 48109). b. *O. tubaeforme*, inflorescence (Daniel & Bartholomew 4991), flower (Breedlove & McClintock 34236). c. *O. cuspidatum*, inflorescence (Wendt et al. 2802), flower (Hernández G. 2592). d. *O. glaberrimum* (Tenorio L. et al. 8297). (Inflorescences  $\times 2.4$ , flowers  $\times 1.5$ .)

*Odontonema breedlovei* is known only from the holotype. It appears to differ from *O. callistachyum* solely by the corolla color (yellow, as noted on the specimen's label; the original color is not preserved on the few large corollas present) and the somewhat smaller capsules (10.5–14 mm long vs. 15–23 mm long). Either the label data is in error or the plant represents a form of *O. callistachyum* with yellowish corollas. The former explanation appears more likely, because a purplish coloration is evident on pedicels, calyces, small corolla buds, and septae of trichomes in the inflorescence on the type. This coloration is almost universal among specimens of *O. callistachyum* but is not known in Mexican species with yellow or whitish corollas.

*Odontonema callistachyum* exhibits some variation that is suggestive of *O. cuspidatum* and *O. tubaeforme*. The dichasia are very rarely pedunculate (usually when there are two dichasia per bract) as in the former species and in Hernández G. 569 from Veracruz and Balogh 944 from Chiapas, the dichasia are whorled as in the latter species. The pinkish purple corollas readily distinguish this species. Even when corolla color is not evident on dried specimens, the purplish color of inflorescence trichomes, pedicels, and calyces often persists and helps to identify the species. Specimens in which the variation is particularly noteworthy are discussed below. Information from them is not included in the description above.



*Thyrsacanthus geminatus* is included under this species with some hesitation. Duplicates of the type exhibit variation in inflorescence pubescence and dichasial placement and form. Knowledge of corolla color would be helpful in placing this name, but no information to that effect is provided on the specimens. On the isotype at F the dichasia are whorled (4/node) and pubescence of rachis is sparse and concentrated in lines. These two features are more suggestive of *O. tubaeforme* than *O. callistachyum*. Although *O. callistachyum* can have whorled dichasia, they are very rare in the species. The isotype at P has all dichasia opposite, a purplish cast to the corollas, and the pubescence of the rachis is similar to that of *O. callistachyum*. In some respects the isotype at US has plants intermediate between *O. tubaeforme* and *O. callistachyum*. Pubescence of the rachis is sparse (but not correct for either), flexuose-antrorse, 0.1–0.4 mm long, and  $\pm$  evenly disposed, and a purplish cast is evident on some dried corollas. The isotype at K is similar with sparse, antrorse to antrorsely appressed, evenly disposed pubescence, opposite and sessile to pedunculate dichasia, and a purplish cast to the corollas. The holotype has pubescence similar to *O. callistachyum* and whorled, sessile dichasia. *Donnell Smith 1728* was collected in April 1889 from the same locality as the type of *T. geminatus*. On the newer growth, the trichomes are very similar to those of *O. callistachyum*, and it has proximal pedunculate dichasia that may actually represent nascent branches of the inflorescence. Another collection resembling the type of *T. geminatus* is *Miranda 1755* (Chiapas: Barranca Aguas Calientes, US). It combines some features of both *O. callistachyum* and *O. tubaeforme*. It has numerous whorled dichasia; the lower dichasia are pedunculate (possibly representing nascent branches); pubescence of the rachis comprises sparse,  $\pm$  evenly disposed, flexuose-antrorse eglandular trichomes to 0.1 mm long; and bracts near middle of inflorescence are lance-subulate, 6–7 mm long. Unfortunately the color of the corolla is not known.

Species sometimes occur in close proximity to one another, and the possibility of hybridization exists. The ranges of several species in the *O. callistachyum* complex (including *O. callistachyum*, *O. cuspidatum*, and *O. tubaeforme*) overlap in southern Mexico and northern Central America. Some of the rare and unusual forms noted above of otherwise consistent species may represent hybrids.

ADDITIONAL SPECIMENS EXAMINED. **Mexico.** CHIAPAS: 3.4 mi NE of Tziscaco Camp, *Balogh 944* (US); Mpio. Tenejapa, paraje of Kotol Te', Yochib, *Breedlove 7359* (DS); Mpio. Tenejapa, paraje of Kulak'tik, barrio of Chana', *Breedlove 7553* (DS, F, MICH, US); Mpio. Tenejapa, paraje of Mahben Chauk, Shaki 'Uk'um, *Breedlove 7585* (DS, F, MICH, US); Mpio. La Trinitaria, Lago Tsiskaw on Guatemala border, 30 mi E of La Trinitaria, *Breedlove 9752* (DS, F, MICH, US); Mpio. Solusuchiapa, 2–4 km below Ixhuatan along rd to Pichucalco, *Breedlove 24173* (DS, MEXU); Mpio. Ocozocoautla de Espinosa, 45 km N of Ocozocoautla just above Malpaso, *Breedlove 32845* (DS, MICH), *Breedlove & Thorne 20747* (DS); Mpio. Las Margaritas, W side of Laguna Miramar E of San Quintín, *Breedlove 33247* (DS); Mpio. Osumacinta, 11–15 km NW of Soyalo on rd to La Bombana and Chicoasén, *Breedlove 33798* (DS); Mpio. La Trinitaria, E of Laguna Tzikaw, Monte Bello National Park, *Breedlove 35159* (DS); 10 km ENE of Dos Lagos above Santa Elena, *Breedlove 48811* (CAS); Mpio. Peltalcingo, Ahk'ulbal Nab above Peltalcingo, *Breedlove 49917* (CAS); Mpio. Peltalcingo, Ahk'ulbal Nab above Peltalcingo, *Breedlove 50444* (CAS); Mpio. Cintalapa, Oaxaca border near La Ciénega de León, *Breedlove & Almeda 48190* (CAS, MEXU); Mpio. Ocosingo, 70 km SW of Palenque on rd to Ocosingo along the Jol Uk'um, *Breedlove & Almeda 48381* (CAS, MEXU), *Breedlove & Keller 49594* (CAS); Mpio. Ocosingo, cascade below Mesbilja about 10 km above Abasolo, *Breedlove & Almeda 57146* (CAS); Mpio. San Fernando, 20 km NW of San Fernando just beyond Colonia Cuauhtémoc, *Breedlove & Bourell 68244* (CAS); Mpio. La Trinitaria, Km 21–23 along rd from Lago Tzicao to Santa Elena, *Breedlove & Daniel 71211* (CAS); Mpio. Jitotol, 5 km SE of Jitotol along rd to Bochil, *Breedlove & Keller 49272* (CAS, MEXU); Mpio. Las Margaritas, confluence of Río Ixcán with Río



Lacantum (Río Jataté) on Guatemala border, *Breedlove & McClintock* 34057 (DS, MEXU); Mpio. El Bosque, 7 km NE of the Jitotol–Pichucalco jct on rd from Bochil to Simojovel, *Breedlove & Smith* 32497 (DS); Mpio. San Juan Cancuc, Yaal wakax, *Brett* 795 (CAS); El Chichón, between Ixtacomitán and Chapultenango, *Burnham* 6 (BM); between San Fernando and Moravillas (near Lago Malpaso), 4–66 mi NW of San Fernando, *Croat & Hannon* 64983 (BM, CAS); along Hwy 195 between Chiapa de Corzo and Pichucalco, 0.6 mi N of Tapilula, *Croat & Hannon* 65256 (CAS); Agua Azul between Palenque and Ocosingo, ca. 10 mi SW of Río Tulija, *Daniel & Bartholomew* 5007 (CAS); between Palenque and Ocosingo, 12.2–17.4 mi N jct. rd to Yajalón, *Daniel & Bartholomew* 5013 (CAS); between Palenque and Ocosingo, 9.7 mi N of Ocosingo, *Daniel & Bartholomew* 5014 (CAS, DUKE, K, MICH); 37 km NW of Bonampak, 6 km NNW of Nuevo Guerrero, *Davidse et al.* 20533 (BM, MEXU); Mpio. La Trinitaria, N del Lago Tziscaco, *Espejo et al.* 3104 (MEXU); Mpio. Tumbalá, Agua Azul, *Fernández N.* 1495 (MEXU); La Ceiba, 6 km E de Raudales, *González Q.* 3442 (DS, MICH, WIS); 3.6 mi N of Ocosingo on rd to Palenque, *Luckow* 2568 (CAS); Mpio. Ishuatán, 9 km N de Tapilula, *Martínez S. et al.* 3220 (CAS, MEXU, WIS); Ruina Palenque, *Matuda* 3694 (F, K, MICH); between Tumbalá and El Salto, *Nelson* 3373 (US); Mpio. Altamirano, 20 km N a Colonia Puebla Nueva, *Pérez M.* 215 (CAS, MICH); Xalom Ja', 4 km O de Cancuc, *Sántiz C.* 450 (CAS); S. Martín und Ocosingo, *Seler & Seler* 2204 (K, US); 3.5 km al E de Tziscaco sobre el camino de las Lagunas de Montebello–Bonampak, *Téllez & Villaseñor* 6613 (CAS, MEXU); Mpio. Tenejapa, paraje of Mah-benchauk, barrio of Tih Ha', *Ton* 1417 (DS, F, MICH, US), 2022 (DS, F, MICH, US), 2271 (DS); Mpio. Ocozacoautla de Espinosa, SW side of Presa de Malpaso, *Ton* 3317 (DS, F, MICH, WIS), 3806 (DS, DUKE, WIS); Mpio. Ocosingo, near Rancho Mumuntik near Ocosingo, *Ton* 3472 (DS, DUKE, F); Mpio. Santa Catarina Pantelho, near Rancho Buena Vista near Pantelho, *Ton* 3649 (DS, DUKE); Mpio. San Cristóbal de las Casas, Santa Cruz en San Felipe, *Ton & Concepción Mtz. de López* 9485 (CAS).—GUERRERO: between Atoyac and Puerto del Gallo, 2.1 km NE of bridge at El Paraíso, *Daniel* 5368 (C, CAS, K, MEXU, MICH, MO, US); Distr. Galeana, Río de las Parotas, *Hinton* 11181 (GH, K, MICH, UC, US).—HIDLAGO: along Hwy 105 between Zacualtilpán and Acatipa, 0.4 mi S of Acatipa, *Daniel & Bartholomew* 5079 (CAS, MICH); Mpio. Tenango de Doria, Las Juntas, 2 kms río arriba de la carr., *Gimate L.* 221 (MICH); San Bartolo Tutotepec, *Gimate L.* 575 (CAS, MICH).—JALISCO: along hwy in gorge of Río Horcones, ca. 20 km SSW of Puerto Vallarta, *Dieterle* 3990 (MICH).—MICHOACÁN: Ostula, *Emrick* 46 (F); Distr. Coalcomán, Huizontla, *Hinton et al.* 12585 (DS, K, US).—OAXACA: along Hwy 175 between Valle Nacional and Oaxaca, 4.3–6 mi above bridge at Valle Nacional, *Croat & Hannon* 65513 (CAS); Chinantla, *Galeotti* 510B (US); Tanetze, *Galeotti* 510N (F, UC, US, W); Distr. Choapan, 4 km S de San Juan del Río, *García M. et al.* 2930 (CAS); Mpio. Sta. María Chimalapa, ca. 1 km E de Sta. María por la vereda al Arroyo Sangre, 16°55'N, 94°40'W, *Hernández G.* 569 (CAS); Sierra San Pedro Nolasco, Talea, etc., *Jürgensen* 407 (K), 877 (BM, K), 894 (BM, K); Distr. Tuxtepec, Chiltepec, *Martínez C.* 518 (UC, US), 626 (CAS, UC); Mpio. San Miguel Chimalapa, ca. 38–41 km N de San Pedro Tapanatepec, lat. 16°43'–44'N, long. 94°5'–10'W, *Maya J.* 982 (CAS), 1025 (CAS), 1060 (CAS), 1222 (CAS); near Tuxtepec, *Nelson* 354 (US); Distr. Mixe, Mpio. Totontepec, Totontepec, 17°15'N, 96°00'W, *Rivera Reyes* 258 (CAS); Distr. Juchitán, "Arroyo Pita," 23 km N de Lázaro Cárdenas, brecha a Sta. María Chimalapa, *Tenorio L. et al.* 3436 (K); Distr. Teotitlán, 8 km NW de Huautla de Jiménez, hacia Teotitlán del Camino, *Torres C. & Antonio M.* 6572 (CAS, F); Distr. Mixe, Mpio. Totontepec, 8 km W de Totontepec, camino a Villa Alta, *Torres C. & Ramírez* 8519 (CAS); Distr. Choapan, Mpio. San Juan del Río, 7.9 km O de San Juan del Río, carr. a Choapan entrando por Xochiapa (Playa Vicente), *Torres C. et al.* 9463 (CAS).—PUEBLA: regio Huauchinango, *Asplund* 1054 (F); Mpio. Zapotitlán de Méndez, Atehuiztita, 4.7–5 km SE de Zapotitlán, carr. a Zacapoaxtla, *Campos V. et al.* 116 (CAS), *Tenorio L. et al.* 12740 (CAS); alrededores de Xicotepec de Juárez, *González Q.* 777 (DS, MICH); 2 km N de Xicotepec de Juárez, *Gutiérrez R.* 115 (US); Laguna Seca, 20 km NNE de Villa Juárez, Km 34 carr. Méx. Tuxpan, Ver., *Romero R. s.n.* (MICH); Carlos Pacheco, *Salazar s.n.* (US); Mpio. Xicotepec de Juárez, 5 km NE de Xicotepec, carr. a La Ceiba, *Toriz A. et al.* 278 (CAS); Mpio. Zapotitlán de Méndez, 6 km NW de Zapotitlán, carr. a Tepango, *Toriz A. et al.* 490 (CAS); carr. Cuetzalan San Andrés, Cuetzalan, *Zola B.* 203 (F); Xochitlán, carr. Zacapoastla–Xochitlán, *Zolá B.* 291 (F).—QUERÉTARO: Mpio. Landa, Piedra Blanca, S del Rincón, *González* 1417 (MEXU); Mpio. Landa, 1–5 km SE de Neblinas, *Rubio* 2286 (CAS).—SAN LUIS POTOSÍ: ca. 5 mi NE of Xilitla, *King* 4430 (F, MICH, UC, US); 3 km SW de Aquismón, *Rzedowski* 9898 (DS, MICH).—TABASCO: Mpio. Tacotalpa, Rancho Villa Lúz, la cascada, *Ventura A.* 21464 (MEXU).—VERACRUZ: Consolapa, Coatepec, *Avendano R. et al.* 136 (F, K); Texolo, Xico, *Avendano R. et al.* 168 (F); Vallée de Córdoba, *Bourgeau* 1689 (K, L), *s.n.* (US); Tezonapa, between Córdoba and Tierra Blanca near El Palmar, 15 mi from Tezonapa, *Carlson* 1311 (F); Mpio. Alto Lucero, Rancho Nuevo, 19°46'N, 96°41'W, *Castillo C. & Vázquez* 1504 (F); Mpio. J. de Ferrer, Cerro de Villa Rica, 19°48'N, 96°46'W, *Castillo C. et al.* 1753 (F); Mpio. Huatusco, Km 6, carr.



Huatusco–Xalapa, *Cortina V. 32* (CAS); E. Zapata, Corral Falso, Barranca Sn. Antonio, 19°27'N, 96°45'W, *Gandara & Dorantes 12* (F); between Papantla and Zamora, *Goldman 90* (US); entre Misantla y Yecuatla, *Gómez-Pompa & Riba 136* (F); Córdoba, *Greenman 164* (F); Mpio. Teocelo, Teocelo, *Guerrero C. 1752* (UC); Mpio. Yecuatla, camino a San Cristóbal, 19°52'N, 96°46'W, *Gutiérrez B. 60* (F); Mpio. Yecuatla, Progreso de Juárez, 19°51'N, 96°47'W, *Gutiérrez B. & Paredes L. 26* (F); Fortín, *Kerber 337* (BM, K, MICH); just S of Coatepec, *Langman 3385* (US); Colipa, *Liebmann 10700* (F), *s.n.* (L); Mirador, *Liebmann 10703* (US), *s.n.* (K, L, W); Mirador, *Linden 192* (K, MICH), *Purpus 15335* (F, US); near Caprico, between Xalapa and Huatusco, *Long & Burch 3230* (CAS, DUKE); Atoyac, *Matuda 1405* (MICH), *1410* (MICH), *1413* (MICH, US); Mpio. Chocamán, 1 km N of Chocamán, *Nee 23882* (F); Mpio. Xico, Cascada de Texolo, 3 km SE of Villa Xico (Jico), *Nee & Taylor 26000* (F, MO, UC); Mpio. Tlacotepec de Mejía, 7.5 km E of El Mirador on Totutla–Conejos hwy, *Nee & Taylor 26654* (F); Mpio. Tlapacoyan, along Río Tablazos, 6 km SSW of Tlapacoyan, *Nee et al. 26097* (F); abajo de Plan de las Hayas, *Nevling & Gómez-Pompa 990* (F); Córdoba, *Orcutt 3347* (BM, DS, F, GH, K, MO, US); Mpio. Xalapa, Rancho Guadalupe, Jardín Botánico F. J. Clavijero, *Ortega O-827* (F), *1323* (F); Mpio. Hidalgotitlán, camino Ejido del Moral a 600 m del campamento Hnos. Cedillo, *Ortiz & Martiniano 141* (CAS, F); near Jalapa, *Pringle 8137* (BM, F, ISC, K, L, UC, US); Zacuapan, Barranca de Tenampa, *Purpus 2284* (F, UC, US), *2944* (BM, UC); Zacuapan, *Purpus 3685* (UC), *14234* (F); Barranca near Rancho Viejo, *Purpus 15002B* (UC); Fortín de las Flores, *Romero R. s.n.* (DS, MICH); Mpio. Xalapa, Caida de Agua, Salto de Gato, *Ronzón G. 2* (BM, CAS, F); Cuapichapa, Puente de San Miguel, *Rosas R. 969N* (F); Mpio. Cuauhtlapan, Rincón Barrientos, *Rosas R. 1085* (CAS, F, U); Barranca de San Miguel, Km 17 carr. Orizaba–Córdoba, *Rosas R. 1146* (F); near Huatusco, *von Rozynski 758* (F); Jalapa, *C. Smith 1699* (MICH); Mpio. Teocelo, Cascada Texolo, 8 km SO de Coatepec, *S. Smith 6083* (F); Mpio. Zozocolco, 2.5 km N de Zozocolco, *Tenorio L. et al. 8582* (CAS); Mpio. Hidalgotitlán, brecha Hnos. Cedillo–Agustín Malgar, 17°16'N, 94°37'W, *B. Vázquez 510* (F); Teocelo, Barranca de Teocelo, *V. Vázquez T. 95* (F, UC), *Zola B. 137* (F); Nacaxtla por la carr. rumbo a Zomajapan, Zongolica, 18°40'N, 96°59'W, *V. Vázquez T. 183* (F); Zoncuantla, *Velázquez L. VL-11* (F); Tlazololapan, Tequila, *Velázquez L. 121* (F, UC), *362* (F); Mpio. Totutla, Mata Oscura, *Ventura A. 4738* (CAS, MICH); Mpio. San Juan–Coscomatepec, El Encino, *Ventura A. 4788* (CAS, MICH); Mpio. Misantla, Cruz alta, *Ventura A. 5098* (CAS, MICH); Mpio. Misantla, Km 9, *Ventura A. 8118* (MICH); Mpio. Xalapa, Mártires de Chicago, *Ventura A. 9491* (MICH); Mpio. San Juan Coscomatepec, Baranquilla, *Ventura A. 16924* (WIS); vic. of Río Tonto, Ejido de Almilinga, 6 km W of Campo Experimental de Hule El Palmar, Zongolica, *Vera S. 2825* (MICH, US); Mpio. Minatitlán, orilla del Río Grande, 15.7 km E de La Laguna, *Wendt et al. 2902* (CAS, F, L, MICH); Fortuño, Coatzacoalcos River, *Williams 8610* (F, US).

***Odontonema cuspidatum*** (Nees) Kuntze, Revis. gen. pl. 2: 494. 1891. *Thyrsacanthus cuspidatus* Nees in A. DC., Prodr. 11: 323. 1847.—TYPE: MEXICO. Oaxaca: Sierra S. Pedro Nolasco, Talea, etc., *Jürgensen 985* (lectotype, here designated: K!; isolectotype: BM!).

Shrub to 5 m tall, young stems quadrate to quadrate-sulcate, sparsely pubescent with antrorse (to erect to flexuose) eglandular trichomes 0.1–0.5 mm long, trichomes often  $\pm$  concentrated in 2 lines, soon glabrate. Leaves petiolate, petioles to 30 mm long, blades ovate-elliptic to elliptic to obovate-elliptic, 39–310 mm long, 15–130 mm wide, 1.7–5.6 times longer than wide, acuminate to falcate at apex, acute to attenuate at base, surfaces pubescent with cauline-type trichomes (especially along midvein on abaxial surface) or glabrate. Inflorescence of loose to dense, terminal, pedunculate, often basally branched dichasiate (racemes to) thyrses to 500 mm long, 15–170 mm in diameter (including branches) near midpoint of fertile portion, rachis pubescent with erect to flexuose-antrorse eglandular trichomes 0.05–0.3 (–0.5) mm long; dichasia opposite at nodes, 1–3- or more-flowered, (sessile to) pedunculate (at least some dichasia in an inflorescence clearly pedunculate), peduncles to 25 mm long, pubescent like rachis. Bracts lance-subulate to subulate to triangular, those near middle of inflorescence 1.5–2.5 (–6) mm long, 0.7–1.5 mm wide, abaxial surface pubescent like rachis or nearly glabrous. Bracteoles and secondary bracteoles triangular to triangular-subulate, 0.7–1.5 mm long, 0.5–0.8 mm wide, abaxial surface pubescent like bracts or nearly



glabrous. Flowers pedicellate, pedicels often with a reddish cast, 2.5–15 mm long, pubescent like rachis. Calyx often with a reddish cast, 2–5.5 mm long, tube 0.8–1.1 mm long, lobes lanceolate to triangular, 1–5 mm long, 0.8–1.3 mm wide, abaxially pubescent like bracts or nearly glabrous. Corolla red, (15–) 21–35 mm long, externally glabrous (although margins of lobes ciliolate), tube 12–30 mm long, barely or gradually expanded distally into a  $\pm$  distinct throat, throat 5–10 mm long, 2.5–4 mm in diameter (measured flat) near midpoint, upper lip 2–5 mm long, lobes rounded to acute, 1.5–3.5 mm long, 2.5–3 mm wide, lower lip 2.5–6 mm long, lobes ovate to subcircular, 2.5–6 mm long, 1.5–3.5 mm wide. Thrum stamens 7–9 mm long, pin stamens 4–5 mm long, thecae 2.3–3.5 mm long; pollen 4-colporate; staminodes 1 mm long. Thrum style 4–12 mm long, pin style 15–21 mm long, the style nearly glabrous or pubescent with eglandular trichomes, trichomes disposed  $\pm$  throughout or restricted to proximal portion; stigma funnelform or bilobed, lobes equal, 0.2–0.3 mm long. Capsule 16–27 mm long, glabrous, stipe 7–11 mm long, head 9–16 mm long. Seeds subcordate to subrectangular in outline, 2.9–4.2 mm long, 2.2–3.7 mm wide, surface rugose to tuberculate. Chromosome number unknown.

Phenology. Flowering and fruiting throughout the year.

Distribution. Mexico (Chiapas, Hidalgo fide Baum, Morelos, Oaxaca, Querétaro, San Luis Potosí, Tabasco, Veracruz; Fig. 4) and West Indies; in lowland rain forests, montane rain forests, mesophytic montane forests, pine-oak forests, and cloud forests; sea level to 1950 meters. The species is commonly cultivated in the American tropics where it sometimes persists or escapes. Cultivated material has been seen from Mexico and El Salvador. Plants are known as escapes in Lee Co. and Highland Co., Florida, USA. Much of the material from the West Indies is reported as cultivated or persisting from cultivation. It is possible that the species is not native there, and it is likely that the species is not native to many of the Mexican states noted above.

Local names. “Flor de chuparroza” (*Ortiz & Martiniano 183*), “flor de chupa miel” (*Juan 145*).

Uses. *Cházaro & Robles 3199* notes that plants are cultivated for medicinal and ornamental uses.

The lectotype is chosen from among the three syntypes (i.e., *Linden 180*, *Jürgensen 894*, and *Jürgensen 985*) listed by Nees in Hooker’s herbarium. One of the syntypes (*Jürgensen 894*) represents *O. callistachyum*. *Jürgensen 985* is the more complete of the remaining syntypes. Baum (1982a) noted that *Linden 180* at G was the lectotype. Her choice, if considered as published, would be in error, however, because she chose an isosyntype rather than a syntype.

*Odontonema cuspidatum* resembles *O. rubrum* (Vahl) Kuntze of Panama and northern South America by its opposite, pedunculate dichasia and short, mostly erect, eglandular trichomes of the rachis. These two species can be distinguished by the following couplet:

- |   |                        |
|---|------------------------|
| Corolla externally pubescent with eglandular trichomes, tube abruptly expanded near the midpoint into a prominent throat, bent at point of expansion, upper lip 6–13 mm long; pollen 3-aperturate; Panama, Colombia, Venezuela. | <i>O. rubrum</i> .     |
| Corolla externally glabrous, tube barely or gradually expanded distally into a $\pm$ distinct throat, straight, upper lip 2–5 mm long; pollen 4-aperturate; Mexico and West Indies.   | <i>O. cuspidatum</i> . |

ADDITIONAL SPECIMENS EXAMINED. **Mexico.** CHIAPAS: Mpio. Pichucalco, 11 km ENE of Pichucalco, *Breedlove 45893* (CAS); Selva Negra above Rayón, *Breedlove 71454* (CAS, MEXU, MICH); Mpio. Rayón, Selva Negra 10 km above Rayón Mezcalapa along rd to Jitotol, *Breedlove & Dressler 29801* (DS, MEXU), *Breedlove & Smith 32417* (DS); Mpio. Huixtla, sitios or along streets of Huixtla,



*Breedlove & McClintock* 23784 (DS); Mpio. Pichucalco, E bank of Río Coamapa above Rancheria Coamapa, *Gilly & Hernández X.* 135 (MEXU, MICH); along Río Pichucalco, 3 km NE of Pichucalco toward Villahermosa, 17°32'N, 93°04'W, *Marcks & Marcks* 895 (WIS); Mt. Ovando, *Matuda* 149 (F, MEXU, MICH, US); F. Las Nubes, *Miranda* 1719 (MEXU); between Tumbalá and El Salto, *Nelson* 3376 (US); inter Ixtacomitán et La Trinidad, *Rovirosa* 880 (K); 40 km S of Sureste on rd to Mal Paso, *Roe et al.* 1393 (MICH, WIS); Mpio. Rayón, 9 mi NW of Pueblo Nuevo Solistahuacán along rd between Rincón Chamula and Rayón, 17°30'N, 93°40'W, *Zuill* 736 (DS).—GUERRERO: La Soledad, *Langlassé* 974 (F, K).—MORELOS: near Cuernavaca, *Halbinger* 42 (GH), *Halbinger & Reko* 301 (US).—OAXACA: 29.8 km S of Valle Nacional, *Bartholomew et al.* 3341 (CAS); 70–75 km S of Tuxtepec on rd to Oaxaca, *Breedlove & Almeda* 56730 (CAS); along Hwy 175 through Sierra de Juárez between Tuxtepec and Oaxaca, 18 mi S of bridge at Valle Nacional, *Croat* 47965 (BM); along Hwy 175 between Valle Nacional and Oaxaca, 17–19 mi above bridge at Valle Nacional, *Croat & Hannon* 65572 (CAS); Mpio. Sta. María Chimalapa, ca. 8–10 km N de Sta. María, 17°00'N, 94°41'W, *Hernández G.* 2089 (CAS); Mpio. Sta. María Chimalapa, Arroyo Sangre, ca. 1–2 km E de Sta. María, 16°54'N, 94°40'W, *Hernández G.* 233 (CAS), 2592 (CAS); Sierra San Pedro Nolasco, Talea, etc., *Jürgensen* 649 (K); Distr. Ixtlán, Mpio. Comaltepec, La Esperanza, *López L.* 404 (CAS), 591 (CAS); Ixtlán, Vista Hermosa, Comaltepec, *MacDougall s.n.* (F); Sierra Juárez, entre Vista Hermosa a Comaltepec, Km 82 entre Tuxtepec a Oaxaca, *Martínez C.* 238 (F, US); Sierra Juárez, entre Vista Hermosa a Comaltepec, Km 136 entre Tuxtepec a Oaxaca, *Martínez C.* 310 (F, US); Distr. Choapam, Yaveo, near Arroyo del Perrico, *Mexia* 9150 (B, CAS, F, K, U, UC, US); Distr. Mixe, Mpio. Totontepec, rumbo Villa alta, 16 km O de Totontepec, *Ramírez G. & Ramírez C.* 543 (CAS); Distr. Mixe, Mpio. Totontepec, Totontepec, 17°15'N, 96°00'W, *Rivera R.* 1259 (CAS); Mpio. Juquila, 4 km S de Lachao, Km 183 carr. Oaxaca–Puerto Escondido, *Rzedowski* 19546 (MICH); 39 km S de Valle Nacional, sobre la carretera a Oaxaca, *Rzedowski* 33777 (WIS); Distr. Ixtlán, Mpio. Comaltepec, 13 km SO de La Esperanza, carr. Tuxtepec–Oaxaca, *Torres C. & Campos* 10922 (CAS); Distr. Mixe, Mpio. Totontepec, 10.5 km N de Totontepec, carr. a Choapan, 17°17'N, 95°59'W, *Torres C. & Cortes* 10405 (CAS); Distr. Ixtlán, Mpio. Comaltepec, 2 km SO de La Esperanza, carr. Tuxtepec–Oaxaca, *Torres C. & Cortes A.* 11677 (CAS); Distr. Juchitán, Chichihua, camino a Sta. María Chimalapa, *Torres C. & Martínez* 5988 (CAS); Distr. Ixtlán, Mpio. Comaltepec, 5 km O de La Esperanza, carr. Tuxtepec–Oaxaca, *Torres C. & Martínez S.* 11294 (CAS); Distr. Tuxtepec, Metates, carr. Tuxtepec–Oaxaca, *Torres C. et al.* 7799 (CAS); Distr. Ixtlán, 21.4 km S de Valle Nacional sobre carretera a Oaxaca, *Wendt et al.* 2261 (CAS); locality and collector unknown, “Oaxaca 1842”, “franco,” (W).—QUERÉTARO: Mpio. Landa, 1 km NO de San Onofre, *Rubio* 1888 (CAS); Mpio. Landa, Rancho Nuevo, 1–2 km SE de San Onofre, *Rubio* 802 (CAS), 892 (CAS); Mpio. Landa, 10 km SE de Agua Zarca, sobre camino a Pisaflores, *Rzedowski* 45169 (MEXU).—SAN LUIS POTOSÍ: Mpio. San Antonio, Tokoy, *Alcorn* 3328 (MEXU).—TABASCO: Teapa, *Linden* 180 (G, K); Mpio. Teapa, Puyacatengo, *Ventura A.* 20601 (MEXU).—VERACRUZ: Sierra de Tuxtla, Cerro Tuxtla, 3 mi WSW of Santiago Tuxtla, *Anderle* 42 (US); NW de Santiago Tuxtla, *Beaman* 6078 (F, U); Catemaco–Sontecomapan rd, 8.5 km SW of Sontecomapan, *Breckon & Breckon* 2023 (F, MEXU, WIS); Catemaco, *Boege* 3199 (MEXU); Mpio. Soteapan, faldas del Cerro el Platanillo, Sierra de Santa Martha, *Calzada* 5091 (F); Presa del canala de Riego, 2 km antes de la Barranca de Tlacuitlapa, 19°23'N, 96°48'W, *Castillo C. & Tapia* 802 (F); Mpio. San Andrés Tuxtla, Est. Biol. Tropical Los Tuxtlas, *Cedillo T.* 2644 (MEXU), *Ibarra M.* 447 (MEXU), 787 (MEXU), *Ibarra M. & Sinaca C.* 1922 (MEXU), *Martínez C.* 1724 (CAS, F, MEXU, MICH, US), 2178 (BM, F, K, MEXU); Mpio. San Andrés Tuxtla, 20 km N de San Andrés Tuxtla, *Cedillo T.* 3457 (CAS); Mpio. Tatahuicapa, entre Piedra Pasada & Guadalupe Victoria, *Cházaro* 3257 (MICH, WIS); Mpio. Las Choapas, poblado Abasal, orillas del Río Tonala, *Cházaro & Robles* 3199 (WIS); Mpio. Catemaco, 4.5 km W of Sontecomapan on rd to Catemaco, *Cowan et al.* 5787 (CAS); Mpio. San Andrés Tuxtla, Est. Biol. Tropical Los Tuxtlas N of San Andrés Tuxtla between Sontecomapan and Montepio, *Croat & Hannon* 63132 (CAS); region of San Andrés Tuxtla, near Tapalapan NW of Santiago Tuxtla, *Dressler & Jones* 41 (BM, MICH, UC, US); Fortín, *Fisher* 35508 (F, US); Mpio. Las Choapas, Las Cruces, *Gómez-Pompa & Nevling* 1514 (F); camino Bastonal a Santa Martha, 18°24'N, 94°57'W, *Gómez-Pompa et al.* 5403 (F); 35 km NE of Catemaco, *den Held & van Rhijn HC* 13 (U); Playa Escondida, near Sontecomapan, ca. 18°34'N, 95°06'W, *Holstein & Armbruster* 20367 (MEXU); Volcán San Martín, Los Tuxtlas, *Houck* 37 (MICH); Mpio. Hidalgotitlán, Campamento H. Cedillo a 9 km a La Gloria, *Juan* 145 (CAS, F); región de Los Tuxtlas, hacia Laguna Escondida, *Lot* 965 (F, MEXU); Playa de Vaca, *Martínez C.* 1517 (CAS, F, MICH); Mpio. Catemaco, 7 km NE of Sontecomapan, *Nee* 22596 (F); Mpio. Pajapan, 5 km NW of Pajapan, *Nee & Calzada* 22755 (F, MO); Mpio. Soteapan, 13 km E of Tebanca (13 km E of E side of Lago Catemaco), *Nee & Hansen* 18790 (F); Mpio. Las Choapas, along Río Grande near main gravel rd of Uxpanapa region, 17°16'N, 94°22'W, *Nee & Taylor* 29861 (F); Mpio. Soteapan, cerca del Volcán de Santa Martha (en



las Faldas), 18°25'N, 96°56'W, *Ortega O. et al. 1129* (F); Mpio. Hidalgotitlán, Campamento Hnos. Cedillo a 9 km por El Río de Los Cedros rumbo SO, *Ortiz & Martiniano 183* (BM, CAS, F, L); Córdoba, *Plunkett 155* (F); ca. 1 km S of Monte Pie, ca. 18°38'N, 95°05'W, *Poole et al. 1435* (MEXU); Mpio. Catemaco, "Playa Escondida," 10 km N of Sontecomapan, *Schatz & Nee 206* (F, MEXU); Mpio. Catemaco, 8 km (air) NE of Catemaco, *Schatz & Nee 241* (F, US); Laguna Escondida, 5 km de La Est. de Biol. de Los Tuxtlas, *Soto & Horvitz 25* (F, MEXU); Salto de Syipantla, 12 km W de Catemaco, *Torres C. & Hernández 6445* (CAS); Mpio. Hidalgotitlán, Río Soloxuchil SW del Campamento Hnos. Cedillo, 17°16'N, 94°37'W, *B. Vázquez 309* (F); Mpio. Jesús Carranza, 2 km N del Poblado 2, Ejido F. J. Mina, 17°16'N, 94°40'W, *M. Vázquez T. et al. V-2463* (CAS); Mpio. San Pedro Soteapan, 3 km N de Santa Martha, 18°25'N, 94°56'W, *F. Vazaquz B. & Hernández 42* (F); Mpio. Catemaco, Chochoví, *Ventura A. 5862* (CAS); Mpio. Hidalgotitlán, desde el Poblado 6 al S por la brecha y la vereda, 17°15'N, 94°30'W, *Wendt et al. 2802* (CAS).—State Unknown: without locality, as "Justicia tubulosa No. 43," *Sessé et al. 297* (F).

***Odontonema glaberrimum*** (M. E. Jones) V. M. Baum, *Brittonia* 34: 427. 1982.  
*Anisacanthus glaberrimus* M. E. Jones, *Contr. W. Bot.* 15: 151. 1927.—  
 TYPE: MEXICO. Nayarit: El Tigre Mina, Acaponeta, 1 Mar 1927, *M. E. Jones 22976* (holotype: POM!).

Shrub to small tree to 3 m tall, young stems quadrate to quadrate-sulcate, glabrous or  $\pm$  evenly puberulent with flexuose to antrorse eglandular trichomes 0.05–0.2 mm long. Leaves subsessile to petiolate, petioles to 11 mm long, blades ovate to elliptic to obovate-elliptic, 25–200 mm long, 11–78 mm wide, 1.7–2.6 times longer than wide, acute to acuminate at apex, acute to attenuate at base, surfaces glabrous or pubescent with cauline-type trichomes mostly restricted to major veins, or  $\pm$  evenly pubescent with coarse, flexuose-antrorse eglandular trichomes to 0.6 mm long. Inflorescence of loose to dense, terminal (or sometimes axillary), sessile to pedunculate, unbranched or basally branched dichasiate racemes (or thyrses) to 200 mm long, 10–20 mm in diameter near midpoint of fertile portion, rachis glabrous or evenly pubescent with flexuose to antrorse eglandular trichomes 0.05–0.5 mm long; dichasia opposite at nodes, sessile or subsessile (peduncles to 1 mm long), 1–3- or more-flowered. Bracts often subfoliose proximally, soon becoming subulate to triangular, bracts near middle of inflorescence 1.5–7.5 mm long, 0.8–1.2 mm wide, abaxial surface glabrous or pubescent like rachis. Bracteoles and secondary bracteoles subulate to triangular, 1–4 mm long, 0.6–1.2 mm wide, abaxial surface glabrous or pubescent like rachis. Flowers pedicellate, pedicels 3–13 mm long, pubescent like rachis or sometimes nearly glabrous even when rachis is pubescent. Calyx 2.5–5 mm long, tube 0.5–1 mm long, lobes subulate, 2–4.5 mm long, 0.4–0.8 mm wide, abaxially pubescent like rachis or glabrous. Corolla red, 16–32 mm long, externally glabrous, tube 10–17 mm long, expanded distally into a distinct throat, throat 3–8 mm long, 3–6 mm in diameter (measured flat) near midpoint, upper lip 6–13 mm long, lobes rounded to acute, 2–3.5 mm long, 1.7–2.5 mm wide, lower lip 6.5–14 mm long, lobes linear-elliptic, 5–12 mm long, 2–4 mm wide. Thrum stamens 12–14 mm long, pin stamens sometimes partially exerted from tube, 4–6.5 mm long, thecae 2–3 mm long; pollen 3-colporate; staminodes 1–1.5 mm long. Thrum style 8–12 mm long, pin style 15–21 mm long, the style glabrous or with sparse eglandular trichomes proximally or pubescent  $\pm$  throughout; stigma 0.2–0.5 mm long, lobes barely or clearly evident, equal. Capsule 18.5–27 mm long, glabrous, stipe 8–12.5 mm long, head 10.5–14 mm long. Seeds subcordate in outline, 5–6 mm long, 4.5–4.8 mm wide, surface smooth. Chromosome number unknown.

Phenology. Flowering and fruiting January–April.



Distribution. Mexico (Chiapas, Durango, Nayarit, Sinaloa; Fig. 4) and Guatemala; in tropical deciduous forests and tropical subdeciduous forests; 100–1300 m.

This species exhibits a distributional range with two apparently disjunct outposts in northwestern Mexico and Chiapas–Guatemala. Baum (1982a) included Jalisco and Michoacán within the distributional range of this species based on specimens here treated as *O. auriculatum*. Interestingly, the distribution of *O. auriculatum* (Fig. 5) occupies the gap between the disjunct outposts of *O. glaberrimum*. These species are very similar and appear to differ primarily by the sessile and auriculate leaves of the former. Plants lacking leaves can be difficult to distinguish, but the difference in rachis pubescence (which is usually evident) is often helpful then. It is perhaps doubtful that *O. glaberrimum* is significantly distinct from *O. auriculatum*. Flores F. & Ruenes 2042 contains both species which undoubtedly grew together. All other collections appear to represent either one or the other species as delimited here.

ADDITIONAL SPECIMENS EXAMINED. **Mexico.** CHIAPAS: Mpio. Arriaga, 6 km N of Arriaga, *Breedlove* 24434 (DS); Mpio. Arriaga, 13 km N of Arriaga along Mex. Hwy 195, *Breedlove & Thorne* 30601 (DS, MICH), *Breedlove & McClintock* 23724 (DS); Mpio. Cintalapa de Figueroa, 5 km W of Rizo de Oro along Mex. Hwy 190, *Breedlove* 49628 (CAS); Mpio. Cintalapa, 3 km W of Rizo de Oro, *Breedlove* 66967 (CAS); along Hwy 190 ca. 2 mi E of Oaxaca border, *Croat* 46278 (CAS, F).—DURANGO: side canyons of barranca of Río Tamazula, between Agua Caliente and La Bajada, *Breedlove* 24478 (CAS); canyons of Río Tamazula between La Bajada and La Junta, *Breedlove* 24506 (CAS, US); Sianorí, *Ortega* 1924 (US).—NAYARIT: Microondas Santa Barbara, 3–3.8 mi E Hwy 15 between Sinaloa border and Acaponeta, *Daniel & Bartholomew* 4727 (C, CAS, K, MEXU, MICH, MO, US); Mpio. Compostela, 4 km NE de Valle de Banderas, 20°50'N, 105°12'W, *Flores F. & Ruenes* 2042 (MICH); Mpio. Xalisco, al E de Palapita, camino a Los Cuarenta, *González* 693 (MEXU); Tiger Mine, Acaponeta, *M. Jones* 23266 (POM); 6–12 km NE of Miramar, rd to Jalcocotán, *McVaugh* 23562 (MICH); 7 km SE del Rancho El Rojo (7 km E de Las Varas, camino a Compostela) por el camino viejo de Mazatán a Las Varas, 21°11'N, 105°06'W, *Téllez V. & Flores F.* 11884 (MEXU, MICH).—SINALOA: Mpio. Sinaloa y Vela, Sierra Surutato, mouth of Cañón de Tarahumares along rd from Morcorito to Surutato, *Breedlove* 19029 (CAS, F, US); ca. 30 mi E of Culiacán along rd between Presa López Mateos and Tamazula, Durango, *Breedlove* 24467 (CAS, MEXU, MICH); Cerro Colorado, *Gentry* 5482 (DS, MEXU, MICH, RSA, US); Distr. Badiraguato, Arroyo de Carrisal, *Gentry* 5801 (DS, MEXU, MICH, RSA, US); Mpio. Culiacán, Tierras Blancas, 2 km N de El Rincón, Brecha a Tamazula, 24°51'N, 107°00'W, *Tenorio L. et al.* 8297 (CAS); Mpio. Rosario, 3.5 km N de Palmarito, 23°02'N, 105°41'W, *Tenorio L. et al.* 8524 (MEXU, RSA).

***Odontonema glabrum*** Brandegees, Univ. Calif. Publ. Bot. 6: 195. 1915.—TYPE: MEXICO. Chiapas: Finca Irlanda, May–June 1914, *Purpus* 7286 (holotype: UC!; isotypes: BM! DS!).

*Odontonema galbanum* Leonard, J. Wash. Acad. Sci. 33: 72. 1943.—TYPE: GUATEMALA. Escuintla: near Barranca Honda, above Las Lajas, ca. 1200 m, 31 Jan 1939, *Standley* 63875 (holotype: US!; isotype: F!).

Perennial herb or shrub (sometimes epiphytic) to 2.5 m tall, young stems subterete to subquadrate, glabrous. Leaves petiolate, petioles to 10 (–23) mm long, blades ovate to narrowly elliptic to obovate-elliptic, 40–275 mm long, 16–85 mm wide, 2.5–5.2 times longer than wide, acuminate to falcate at apex, rounded to acute to attenuate at base, surfaces and margin glabrous. Inflorescence of open, terminal (or sometimes axillary), pedunculate, unbranched or basally branched thyrses to 360 mm long, 15–55 (–100) mm in diameter (including branches) near midthyrses, rachis glabrous; dichasia opposite at nodes, 3-flowered (distally) or more-flowered (proximally), pedunculate, peduncles (1.5–) 4–34 mm long, glabrous. Bracts petiolate and narrowly elliptic to oblanceolate proximally, soon



becoming sessile and subulate to triangular-subulate, those near middle of inflorescence 2.5–7 mm long, 0.7–1 mm wide, abaxial surface glabrous. Bracteoles and secondary bracteoles subulate, 1–5 mm long, 0.4–0.7 mm wide, abaxial surface glabrous. Flowers pedicellate, pedicels 3–12 mm long, glabrous, lateral flowers of dichasia borne on secondary peduncles. Calyx 2–5 mm long, tube 0.5–1 mm long, lobes lanceolate to subulate, 1.7–4.5 mm long, 0.4–0.9 mm wide, abaxially glabrous. Corolla yellow, 22–32 mm long, externally glabrous (although margins of lobes ciliolate), tube 18–29 mm long, expanded distally into a distinct throat, throat 11–15 mm long, 3.5–5.3 mm in diameter (measured flat) near midpoint, upper lip 3–5 mm long, lobes rounded, 1–2.5 mm long, 1.8–3 mm wide, lower lip 2.8–5 mm long, lobes elliptic, 2.8–5 mm long, 2–4.2 mm wide. Thrum stamens 14 mm long, pin stamens 8–11 mm long, thecae 2.6–3.1 mm long; pollen 3-colporate; staminodes 1 mm long. Thrum style 12–16 mm long, pin style 22–26 mm long, the style glabrous; stigma bilobed, lobes equal, 0.2–1 mm long. Capsule 17–21 mm long, glabrous, stipe 8–10 mm long, head 9–11 mm long. Seeds subcircular to subelliptic in outline, 3–4.2 mm long, 2.6–3.3 mm wide, surface rugose to tuberculate. Chromosome number unknown.

Phenology. Flowering: December–August; fruiting: December–June.

Distribution. Mexico (Chiapas; Fig. 6) and Guatemala; in tropical deciduous forests, evergreen seasonal forests, pine-oak woodlands, and montane rain forests; 100 to 1600 m.

Local names. “Cola de Ardilla,” “monte o pluma de oro” (*Boege 1074*).

The holotype of *O. galbanum* from Guatemala has young stems sparsely pubescent in lines with flexuose to antrorse eglandular trichomes. In other respects it agrees with this species.

*Odontonema glabrum* resembles *O. hondurensis* from Belize, Guatemala, and Honduras by its open inflorescence, yellow corollas, and opposite bracts. These two species can be distinguished by the following couplet:

Young stems puberulent with eglandular trichomes to 0.05 mm long; inflorescence a panicle of dichasiate racemes, rachis puberulent like stems, dichasia sessile to subsessile (i.e., peduncles to 0.5 mm long); corollas 14–22 mm long, externally puberulent with glandular and eglandular trichomes. *O. hondurensis*.

Young stems glabrous; inflorescence an unbranched or basally branched thyrses, rachis glabrous, dichasia pedunculate, peduncles (1.5–) 4–34 mm long; corollas 22–32 mm long, externally glabrous. *O. glabrum*.

ADDITIONAL SPECIMENS EXAMINED. **Mexico.** CHIAPAS: Huixtla, Finca Sta. Anita, *Boege 1074* (MEXU); Mpio. Angel Albino Corzo, NE slope of Cerro Venado above Finca Cuxtepeque, *Breedlove 48650* (CAS, MEXU), *Breedlove & M. Bourell 67668* (CAS, K, MEXU, MICH, US), *Breedlove & Almeda 56923* (CAS, F, US); Mpio. Angel Albino Corzo, slopes of Río Cuxtepec below Finca Cuxtepec, *Breedlove 50735* (CAS, MEXU, US); Mpio. Angel Albino Corzo, between Finca Cuxtepeque and Finca Cabañas, *Breedlove & Bourell 67391* (BR, CAS, ENCB, MEXU, MO); Mpio. Arriaga, 13 km N of Arriaga along Mex. Hwy 195, *Breedlove & Thorne 30621* (DS, DUKE, F, MEXU, MICH); along rd between Escuintla and Monte Ovando, 2.8 km NW of Turquiz, *Croat 47484* (CAS); El Triunfo Reserve, *Heath & Long MA51* (MEXU); Mpio. Motozintla, El Rosario–Tolimán rd between Huixtla and Motozintla, 15°18'N, 92°23'W, *Heath & Long 2113* (MEXU); Mpio. El Edén, El Edén, *López 1347* (ENCB); Mpio. Unión Juárez, Volcán Tacaná, 8 km SW de Unión Juárez, camino a Cacahoatán, *Martínez S. et al. 19848* (MEXU); Mpio. Tuzantan, 15 km NE de Huixtla, camino a Ejido J. M. Morelos, *Martínez S. et al. 19960* (CAS, MEXU); Escuintla, *Matuda 170* (MEXU, MICH, US); Mt. Tacaná, *Matuda 2470* (MICH); Cascada, Siltepec, *Matuda 5174* (F, MEXU, US); Cintalapa, Escuintla, *Matuda 17430* (F, MEXU); Acacoyagua, *Matuda 17434* (F, K, MEXU), *17629* (F, MEXU); Corcega, Pueblo Nuevo, Com., *Matuda 17657* (F, MEXU); F. Las Nubes, *Miranda 1691* (MEXU); Barr. Aguas Calientes, *Miranda 1729* (MEXU); Cerro del Boquerón, *Purpus 6845* (UC), *7208* (MO, UC, US); Finca S. Antonio, *Quarles van Ufford 118* (U); Mpio. La Concordia, camino a



Custepeques, entre Finca La Perla y Finca Las Cabañas, *Rodríguez G. 122* (CAS); Mpio. Angel Albino Corzo, along Río Cuztepeques near Finca Cuztepeques, *Ton 3842* (DS, F, MICH, US); Mpio. Tapachula, Cantón Manga de Clavo, *Ventura & López 1137* (BM); Mpio. Tuxtla Chico, La Escondida, *Ventura & López 3257* (MEXU).

***Odontonema mortonii*** V. M. Baum, *Brittonia* 34: 430. 1982.—TYPE: MEXICO. Oaxaca: vicinity of Cafetal Concordia, 400–650 m, 1–15 Apr 1933, *Morton & Makrinius 2356* (holotype: US!; isotypes: A! F! K! NY).

Shrub to 2 m tall, young stems subterete to quadrate-sulcate, glabrous or rarely with some internodes sparsely bifariously pubescent with antrorse eglandular trichomes 0.1–0.2 mm long. Leaves subsessile to petiolate, petioles to 17 mm long, blades elliptic to obovate, 80–222 mm long, 32–71 mm wide, (1.8–) 2.8–4.2 times longer than wide, acuminate to subfalcate at apex, acute to attenuate at base, surfaces glabrous, margin entire to crenate. Inflorescence of  $\pm$  loose, terminal (or sometimes borne in axils of distal leaves), pedunculate, unbranched (or basally branched) dichasiate racemes (or panicles of racemes) to 300 mm long, 9–90 mm in diameter near midpoint of fertile portion, rachis glabrous; dichasia opposite (to subopposite) at nodes, 3–many-flowered, sessile (or subsessile, i.e., borne on peduncles to 0.5 mm long). Bracts near middle of inflorescence triangular to subulate, 1.5–4 mm long, 0.6–1.2 mm wide, abaxial surface glabrous (margin ciliate), proximal bracts sometimes linear and longer. Bracteoles triangular to subulate, 1–3.3 mm long, 0.5–1 mm wide, abaxial surface glabrous, secondary bracteoles similar to bracteoles or often smaller. Flowers pedicellate, pedicels 1.5–7 mm long, glabrous, lateral flowers of dichasia not borne on secondary peduncles. Calyx 2–3.5 mm long, tube 0.3–0.8 mm long, lobes subulate, 1.5–3 mm long, 0.5–0.8 mm wide, abaxially glabrous. Corolla yellow, 23–30 mm long, externally glabrous (margins of lobes ciliolate), tube 18–25 mm long, expanded distally into a throat, throat 11–15 mm long, 4–5 mm in diameter (measured flat) near midpoint, upper lip 3–5 mm long, lobes elliptic, 1.5–2 mm long, 1–1.7 mm wide, lower lip 4–5.8 mm long, lobes ovate, 3.5–5.5 mm long, 2–3 mm wide. Thrum stamens 14–16 mm long, pin stamens 9–10 mm long, thecae 2.3–2.5 mm long; pollen 3-colporate; staminodes 1 mm long. Thrum style 10–15 mm long, pin style 19–24 mm long, the style glabrous; stigma 0.1–0.2 mm long, lobes barely distinct, unequal. Capsule 13–15 mm long, glabrous, stipe 4–6.5 mm long, head 7–9 mm long. Seeds 2.7 mm long, 2 mm wide, subelliptic in outline, surface rugose. Chromosome number unknown.

Phenology. Flowering and fruiting February–April.

Distribution. Southern Mexico (Guerrero, Oaxaca; Fig. 6); in mesophytic forests on the Pacific slope; 400–540 m.

ADDITIONAL SPECIMENS EXAMINED. **Mexico.** GUERRERO: “Sierra Madre,” [Pacific slope from Coyuquilla along trail toward Coyuca de Catlán, fide McVaugh 1951], *Langlassé 839* (K, MICH).—OAXACA: river below Candelaria Loxicha, *Alexander 444* (MICH); Mpio. Candelaria Loxicha, “El Pacifico,” 4 km N de Candelaria Loxicha, carr. a Miahuatlán, 15°56'N, 96°28'W, *Campos & Reyes 1439* (CAS, MEXU); Distr. Pochutla, Pilas, vicinity of Concordia, *Makrinius 731* (US).

***Odontonema tubaeforme*** (Bertol.) Kuntze, *Revis. gen. pl.* 2: 494. 1891. *Justicia tubaeformis* Bertol., *Novi Comment. Acad. Sci. Inst. Bononiensis* 4: 405. 1840. *Thyrsacanthus tubaeformis* (Bertol.) Nees in A. DC., *Prodr.* 11: 324. 1847.—TYPE: GUATEMALA. Escuintla: Escuintla, 1836, *Velásquez s.n.* (holotype: BOLO, microfiche!).



- Thyrsacanthus strictus* Nees in A. DC., Prodr. 11: 324. 1847. *Odontonema strictum* (Nees) Kuntze, Revis. gen. pl. 2: 494. 1891.—TYPE: HONDURAS. Without locality or date, *Armstrong s.n.* (holotype: K!).
- Eranthemum coccineum* Lem., Fl. Serres Jard. Eur. 3: no. 240, t. 8. 1847, non *Odontonema coccineum* Leonard, 1958. *Thyrsacanthus lemairianus* Nees in A. DC., Prodr. 11: 729. 1847, nom. superfl.—TYPE: based on cultivated materials provided by Jacob-Makoy of Liège from an unknown source; plants apparently arrived on the European Continent via England under “*Aphelandra* sp. nov.”; specimens are not known.
- Thyrsacanthus pantasmensis* Oerst., Vidensk. Meddel. Dansk Naturhist. Foren. Kjøbenhavn 1854: 144. 1855. *Odontonema pantasmense* (Oerst.) Kuntze, Revis. gen. pl. 2: 494. 1891.—TYPE: NICARAGUA. “Skyggefulde Skov paa Bjerget Pantasmo i den nordlige Deel af Segovia,” ca. 4000 ft, Jan, *Oersted 10709* (holotype: C, photos: F! US!).
- Thyrsacanthus longifolius* Oerst., Vidensk. Meddel. Dansk Naturhist. Foren. Kjøbenhavn 1854: 145. 1855. *Odontonema longifolium* (Oerst.) Kuntze, Revis. gen. pl. 2: 494. 1891.—TYPE: “i Naerheden af Nicaraguasö ved Tortuga,” Mar 1847, *Oersted 10708* (holotype: C, photos: F! US!).
- Thyrsacanthus flagellum* Oerst., Vidensk. Meddel. Dansk Naturhist. Foren. Kjøbenhavn 1854: 146. 1855. *Odontonema flagellum* (Oerst.) Kuntze, Revis. gen. pl. 2: 494. 1891.—TYPE: COSTA RICA: Cartago: “i den taette Urskov ved Turrialva,” May, *Oersted 10706* (holotype: C, photos: F! US!).
- Odontonema amicorum* V. M. Baum, Brittonia 34: 425. 1982.—TYPE: BELIZE. Toledo: Temash River, 100 ft, 3 May 1935, *Schipp 1353* (holotype: K!; isotypes: A! CAS! F! G, MICH! NY).

Shrub to 3 m tall, young stems subquadrate to quadrate-sulcate, pubescent with flexuose to retrorse to retrorsely or antrorsely appressed (often crinkled or kinky) eglandular trichomes 0.2–1 mm long, trichomes usually  $\pm$  concentrated in 2 lines. Leaves subsessile to petiolate, petioles to 16 mm long, blades ovate to elliptic to obovate-elliptic, (47–) 155–315 mm long, (16–) 60–117 mm wide, 1.9–4.8 times longer than wide, acuminate to falcate at apex, abruptly acute to attenuate at base, surfaces pubescent with cauline-type trichomes (often concentrated along major veins) or glabrate. Inflorescence of loose, terminal, pedunculate, unbranched dichasiate racemes to 600 mm long, 8–15 mm in diameter near midpoint of fertile portion, rachis pubescent with cauline-type trichomes usually in 2 or more lines; dichasia mostly whorled at nodes, 1–3- or more-flowered, sessile. Bracts lanceolate to lance-subulate, those near middle of inflorescence 2.5–5.5 mm long, 1–1.5 mm wide, abaxial surface pubescent with cauline-type trichomes or glabrate. Bracteoles and secondary bracteoles lance-subulate, 1.5–3.5 mm long, 0.5–0.6 mm wide, abaxial surface pubescent with cauline-type trichomes or glabrate. Flowers pedicellate, pedicels 2–6 mm long, pubescent like rachis. Calyx 2–3.5 mm long, tube 0.5–1 mm long, lobes subulate, 1.5–3 mm long, 0.6–1 mm wide, abaxially pubescent like bracts. Corolla red, 24–33 mm long, externally glabrous (although margins of lobes ciliolate), tube 20–27 mm long, expanded distally into a distinct throat, 9–13 mm long, 3.2–6 mm in diameter (measured flat) near midpoint, upper lip 4–8 mm long, lobes rounded, 2–6 mm long, 1.5–3.8 mm wide, lower lip 4–8 mm long, lobes elliptic to subcircular, 4–7 mm long, 2.5–4.5 mm wide. Thrum stamens 12–15 mm



long, pin stamens 6.5–8 mm long, thecae 2–2.8 mm long; pollen 3-colporate; staminodes 1–4 mm long. Thrum style 10–16 mm long, pin style 22–26 mm long, the style usually proximally pubescent with eglandular trichomes; stigma bilobed, lobes equal, 0.2–0.4 mm long. Capsule 17–23 mm long, glabrous, stipe 7–11 mm long, head 10–13 mm long. Seeds subcircular to subelliptic to broadly obovate in outline, 4–5 mm long, 2.5–3.5 mm wide, surface bumpy to tuberculate. Chromosome number:  $n = 21$ , Daniel et al. 1990.

Phenology. Flowering: January–July; fruiting: March–July.

Distribution. Mexico (Chiapas, Quintana Roo, Tabasco; Fig. 5), Belize, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Panama; in lowland rain forests, lower montane rain forests, and cloud forests; 30–1650 m.

I have adopted the epithet traditionally used for this species, that published by Bertoloni based on a Guatemalan collection. Nees (1847) and Baum (1982a) used this epithet despite not having seen the holotype at BOLO. Although I have not seen the holotype either, the microfiche image of it reveals a plant of *Odontonema* apparently compatible with my concept of the species. It has sessile dichasia and a corolla with a conspicuously ampliate throat. It is not possible to discern from the microfiche whether the dichasia are whorled. Baum (1982a) and Durkee (1986) used the spelling “tubiforme” (tube-shaped) for the epithet of this species; it is clear from Bertoloni’s protologue that he intentionally used the spelling “tubaeforme” (trumpet-shaped).

*Odontonema pantasmense* was included in the synonymy of this species by Baum (1982a). It is difficult to establish from the photo of the type whether it indeed belongs here. In the photo, the dichasia appear to be sessile. Also, the type locality indicates this species; *O. tubaeforme* is only species reported from Nicaragua.

*Odontonema flagellum* was also included in the synonymy of this species by Baum (1982a) and Durkee (1986). From a photo of the type, it is clear that the corolla with a distinct throat and a large, bilabiate limb is very much like that of *O. tubaeforme*; the dichasia appear to be sessile and some are whorled. Also, *O. tubaeforme* is the only species of the genus known from Costa Rica, and other collections of it are known from the vicinity of Turrialba.

*Odontonema amicorum* is included in the synonymy of this species for the first time. Baum (1982a) indicated that *O. amicorum* differed from other species in the *O. callistachyum* complex by its oblong leaf blades and compact, spikelike raceme. The shape of the leaf blades varies from ovate-elliptic to elliptic on specimens of the type and in Baum’s (1982a) illustration. Likewise, similar inflorescences are encountered throughout the *O. callistachyum* complex. The type, and only known collection, of *O. amicorum* was purported to have been a vine. There is no evidence of vinelike habit (i.e., twining or bending of stems or specialized structures for climbing) on the type collection. The whorled, sessile dichasia with pedicellate flowers, the red corollas with a throat 12 mm long, and the bifarious pubescence of the rachis with trichomes 0.2–0.4 mm long are all character states that allow placement of this species in *O. tubaeforme*. A vinelike habit sometimes is noted also (erroneously?) among Mexican collections of *O. tubaeforme* (e.g., Cowan et al. 2853).

I have not seen the type of *Thyrsacanthus longifolius*, but Baum (1982a) did and included the name as a synonym of this species. Oersted’s description in the protologue is not very diagnostic, but the type locality (in the vicinity of Nicaragua near Tortuga) would indicate this species as well.

*Eranthemum coccineum* was included in the synonymy of *O. cuspidatum* by Baum (1982a). Both the figure and the description in the protologue pertain to *O.*



*tubaeforme* as delimited here. For example, both reveal inflorescences with sessile (possibly ternate) dichasia and corollas with long, wide throats.

Baum (1982a) included specimens from Jalisco, Michoacán, Puebla, and Oaxaca within her concept of *O. tubaeforme*. The specimen she cited from Jalisco (i.e., Dieterle 3990) is *O. callistachyum*; the specimen she cited from Oaxaca (i.e., Mexia 9150) is *O. cuspidatum*; the specimen she cited from Michoacán (i.e., Langlassé 974) is *O. cuspidatum* (as correctly annotated by her at F); and the specimen she cited from Puebla (i.e., Seler & Seler 3770) is *O. callistachyum* (as correctly annotated by her at NY).

A specimen from the Pacific coast of Chiapas (Acacoyagua, 15 Jan 1948, Matuda 17433, F) with "mars orange" corollas was annotated by Baum as *O. tubaeforme*. In its opposite, sessile to subsessile dichasia and glabrous rachis it more closely resembles *O. glaberrimum*. It differs from the latter species, however, and resembles the former by its bifarious cauline pubescence with retrorse trichomes to 1 mm long, elongate inflorescence, and tuberculate seeds. Neither species is known from the vicinity of this collection, and Matuda 17433 is not included in either species at this time.

While Mexican specimens of *O. tubaeforme* are generally uniform and readily recognized using the key to species above, the species as it occurs in Central America becomes somewhat more variable. The rachis pubescence varies from nearly absent to somewhat more like that of *O. cuspidatum*. The sessile, mostly whorled dichasia and red corollas still distinguish the species there, however.

ADDITIONAL SPECIMENS EXAMINED. **Mexico.** CHIAPAS: Palenque, Armour 243 (F, US); Mpio. Las Margaritas, near San Quintín along Río Jataté, Breedlove 9121 (DS, US); Mpio. Palenque, 6–12 km S of Palenque on rd to Ocosingo, Breedlove 24210 (DS, DUKE, MEXU), 34955 (DS, MEXU); Mpio. Ocosingo, ruins of Yaxchilán on banks of Río Usumacinta, Breedlove 33909 (DS, MEXU); Mpio. Palenque, near Cascada Mizola, 25 km S of Palenque on rd to Ocosingo, Breedlove & Almeda 57340 (CAS); Mpio. Ocosingo, 70 km SW of Palenque on rd to Ocosingo along the Jol Uk'um, Breedlove & Keller 49520 (CAS); Mpio. Las Margaritas, confluence of Río Ixcán with Río Lacantum (Río Jataté) on Guatemala border, Breedlove & McClintock 34236 (DS, MEXU); 8 km O de Palenque, cerca de la Cascada Matiepa, Cabrera & de Cabrera 3942 (CAS); 9 km S de Palenque, sobre la carretera Palenque–Ocosingo, Cabrera & de Cabrera 8164 (CAS); los alrededores de las ruinas de Palenque, Cabrera et al. 2663 (BM, MEXU); Ocozocoautla, between El Refugio and Rancho Aguajito, Carlson 2104 (F, MICH); between Palenque and Ocosingo, 19.2 mi N of Río Tulija and 27.8 mi N of turn to Agua Azul, Daniel & Bartholomew 4991 (CAS, K, MEXU, MICH, US); Mpio. Palenque, Zona Arqueológica de Palenque, Fernández N. 1033b (MEXU), Ventura A. 19988 (MEXU); Palenque ruins, Hoover 137 (MEXU, US); Mpio. Ocosingo, 8 km S de Benemérito de las Américas, camino a Flor de Cacao, en Zona Marqués de Comillas, Martínez S. 11645 (CAS, F); Mpio. Ocosingo, 8 km S de Benemérito de las Américas, camino a Flor de Cacao, Martínez S. 11735 (MEXU); Mpio. Ocosingo, 15 km NW de Boca Lacantum camino a Palenque, Martínez S. 11903 (MEXU); Mpio. Ocosingo, Ojo de Agua de San Javier, 24 km NW de Crucero Corozal, Martínez S. 15773 (MEXU); Mpio. Ocosingo, 2 km N de Tanhi Perla camino a Monte Líbano Ocosingo, Martínez S. 17634 (CAS); between Ocosingo and Palenque, Mayo & Madison 365 (K); ca. 5 mi from Palenque toward Ocosingo, McDade 205 (DUKE); ruinas de Palenque, Seler & Seler 5468 (CAS); ruinas, 5 km SW of Palenque, Sutherland s.n. (CAS); 7 km S de Palenque, camino a Ocosingo, Téllez V. et al. 5799 (MEXU); Palenque Archeological Site, 3 mi S of Palenque, Thorne & Lathrop 40564 (DS); Pichucalco, half way between Chiapa de Corzo, Walker & Walker W660207 (CAS).—QUINTANA ROO: 25 km N de La Unión en camino a Agua Blanca, Téllez & E. Cabrera 2449 (MEXU).—TABASCO: Mpio. Tacotalpa, Cerro del Madrigal, 7 km de la Est. Tacotalpa hacia Tapijulapa, Cowan et al. 2853 (CAS, MEXU); Mpio. Tenosique, 3.5 km arriba de la ruta Tenosique–Emiliano Zapata en el camino que va a la torre de televisión, cerca al puentes Boca del Cerro, Cowan & Curiel 4683 (CAS); Boca Cerro, Tenosique, Matuda 3566 (MICH); Hwy 186, 2.2 mi W of Tabasco–Chiapas border, ca. 33 mi E of Macuspana, Reznicek et al. M175 (MICH); Mpio. Teapa, Grutas del Coconá, Ventura A. 20161 (CAS); Mpio. Macuspana, Agua Blanca, Ventura A. 20945 (CAS).



## EXCLUDED NAMES

*Justicia corymbulosa* Bertol., *Novi Comment. Acad. Sci. Inst. Bononiensis* 4: 404. 1840.—TYPE: GUATEMALA. Escuintla: Escuintla, 1836, *Velázquez s.n.* (holotype: BOLO, microfiche!).—Gibson (1974) included this name in the synonymy of *O. callistachyum* based solely on the description in the protologue. Several characteristics of the plant noted in Bertoloni's description (e.g., calyx 4-lobed, and entire plant glabrous) are at significant variance with *O. callistachyum*. Baum (1982a) did not include this name. The microfiche of the holotype at BOLO reveals a specimen of *Odontonema* with conspicuously pedunculate dichasia, a feature more suggestive of *O. cuspidatum* than *O. callistachyum*. Although *O. cuspidatum* is not known from wild populations in Guatemala, it is widely cultivated in tropical America. Until the holotype can be fully studied, I exclude this name from the synonymy of *O. callistachyum*.

*Odontonema foliaceo-bracteatum* (Oerst.) Kuntze, *Revis. gen. pl.* 2: 494. 1891. *Thyrsacanthus foliaceo-bracteatus* Oerst., *Vidensk. Meddel. Dansk Naturhist. Foren. Kjøbenhavn* 1854: 446. 1855. *Buceragenia foliaceo-bracteata* (Oerst.) V. M. Baum, *Brittonia* 34: 433. 1982.—TYPE: MEXICO. Veracruz: Mirador, Oct 1841, *Liebmann 10707* (holotype: C!).—In the protologue Oersted expressed some uncertainty about the generic position of this species. The type shows flowers in axillary clusters, and Wasshausen annotated the specimen as *Buceragenia ruellioides* Leonard. Baum (1982a) transferred the species to *Buceragenia*. As *Buceragenia* would appear to represent species of *Pseuderanthemum* with cleistogamous flowers, the ultimate disposition of this species must await further studies.

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